R85 Rotary Disc 16 and 19 Foot Self-Propelled Windrower Headers

OPERATOR'S MANUAL

Revision B

Part #169457 $15

R85 ROTARY DISC 16 FOOT SELF-PROPELLED WINDROWER HEADER

1 INTRODUCTION

This instructional manual describes the operating and maintenance procedures for the MacDon Model R85 Self-Propelled 16 and 19 Foot Rotary Disc Header.

Your new MacDon rotary header is designed to cut, condition, and lay windrows in a wide variety of grasses and hay crops.

CAREFULLY READ ALL THE MATERIAL PROVIDED BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE, OR USE THE MACHINE.

Use this manual as your first source of information about the machine. If you follow the instructions given in this manual, your Mower will work well for many years. A Parts Catalog is also supplied with your new header. If you require more detailed service information, a Service Manual is available from your MacDon Dealer.

Use the Table of Contents and the Index to guide you to specific areas. Study the Table of Contents to familiarize yourself with how the material is organized.

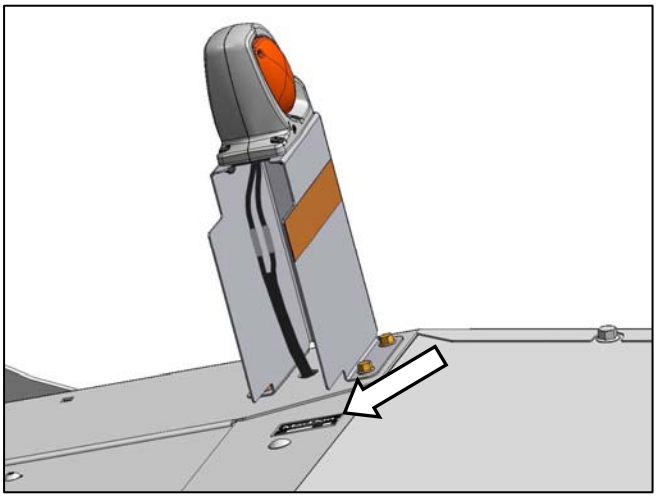
Keep this manual handy for frequent reference, and to pass on to new Operators or Owners. Call your MacDon Dealer if you need assistance, information, or additional copies of this manual.

Store this Operator's Manual and the Parts Catalog with the windrower manuals in the windrower cab storage compartment.

RECORD THE SERIAL NUMBER OF THE HEADER HERE.

_____

The Serial Number plate is located on the top surface at the right end of the header.



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2 SAFETY

2.1 SAFETY ALERT SYMBOL

This safety alert symbol indicates important safety messages in this manual and on safety signs on the machine.

This symbol means:

- **ATTENTION!**
- **BECOME ALERT!**
- **YOUR SAFETY IS INVOLVED!**

Carefully read and follow the safety message accompanying this symbol.

WHY IS SAFETY IMPORTANT TO YOU?

- ACCIDENTS DISABLE AND KILL.
- ACCIDENTS COST.
- ACCIDENTS CAN BE AVOIDED.

2.2 SIGNAL WORDS

Note the use of the signal words **DANGER, WARNING,** and **CAUTION** with safety messages. The appropriate signal word for each message has been selected using the following guidelines:

DANGER

Indicates an imminently hazardous situation that if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation that if not avoided, could result in death or serious injury. It is also used to alert against unsafe practices.

CAUTION

Indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury. It is also used as a reminder of good safety practices.

2.3 SAFETY SIGNS

- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or become illegible.
- If original parts on which a safety sign was installed are replaced, be sure the repair part also bears the current safety sign.
- Safety signs are available from your MacDon Dealer Parts Department.

2.3.1 Safety Sign Installation

a. Be sure the installation area is clean and dry.

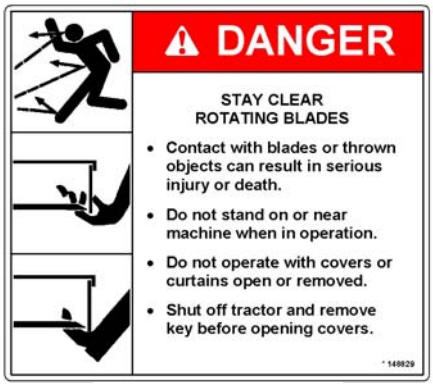
b. Decide on the exact location before you remove the decal backing paper.

c. Remove the smaller portion of the split backing paper.

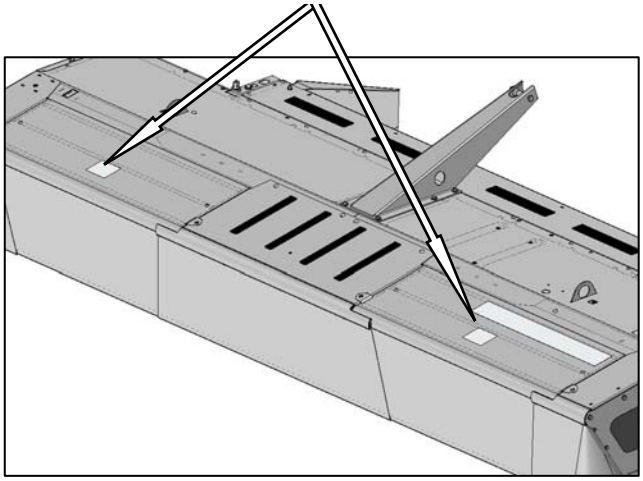
d. Place the sign in position and slowly peel back the remaining paper, smoothing the sign as it is applied.

e. Small air pockets can be smoothed out or pricked with a pin.

2.3.2 Safety Sign Locations


DANGER
STAY CLEAR
ROTATING BLADES
• Contact with blades or thrown objects can result in serious injury or death.
• Do not stand on or near machine when in operation.
• Do not operate with covers or curtains open or removed.
• Shut off tractor and remove key before opening covers.
148829

2 PLCS #148829



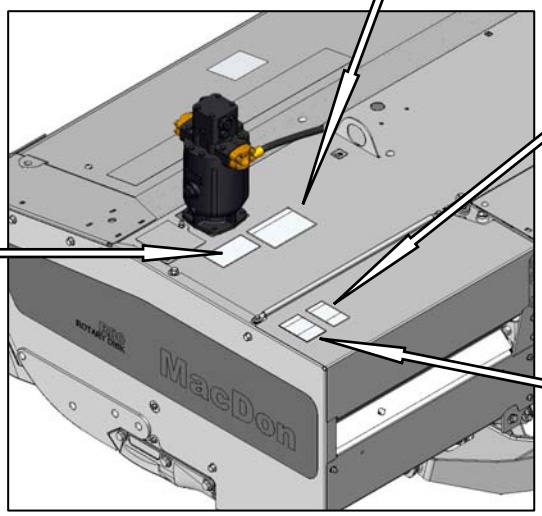
CAUTION
To avoid injury or death from improper or unsafe machine operation:
1. Read the Operator's Manual, and follow all safety instructions. If you do not have a manual, obtain one from your dealer.
2. Do not allow untrained persons to operate the machine.
3. Review safety instructions with all operators annually.
4. Ensure that all safety signs are installed and legible.
5. Make certain everyone is clear of machine before starting engine and during operation.
6. Keep riders off the machine.
7. Keep all shields in place, and stay clear of moving parts.
8. Disengage header drive, put transmission in neutral and wait for all movement to stop before leaving operator's position.
9. Shut off engine and remove key from ignition before servicing, adjusting, lubricating, cleaning, or unplugging machine.
10. Engage locks to prevent lowering of header or reel before servicing in the raised position.
11. Use slow moving vehicle emblem and flashing warning lights when operating on roadways unless prohibited by law.
109843

#109843

#32738

WARNING
DO NOT GO NEAR LEAKS
• High pressure oil easily punctures skin causing serious injury, gangrene or death.
• If injured, seek emergency medical help - Immediate surgery is required to remove oil.
• Do not use finger or skin to check for leaks
• Lower load or relieve hydraulic pressure before loosening fittings.
134070

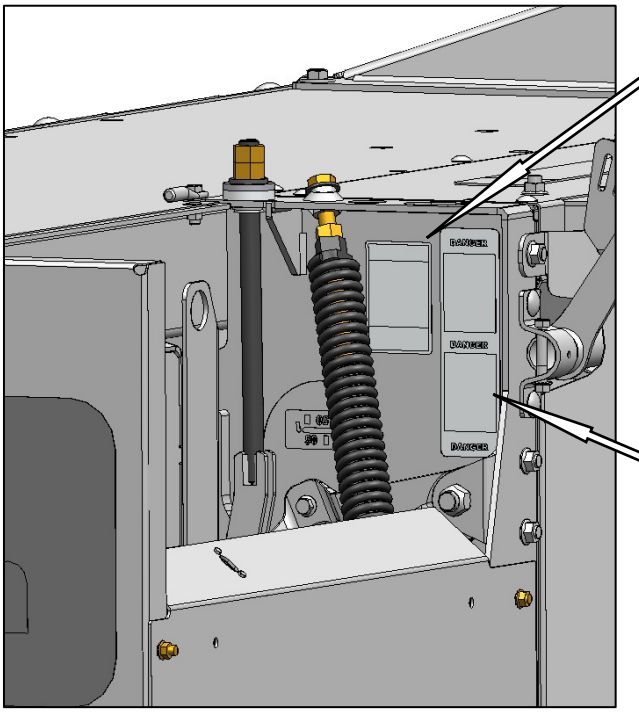
#134070



DANGER
ROTATING DRIVELINE
• Stop engine and remove key before opening shield.
• Keep all shields and guards serviced and in place.
Failure to comply will result in death or serious injury.
170281

#170281

Safety Sign Locations (cont'd)



1 PLC - BOTH SIDES
#142909

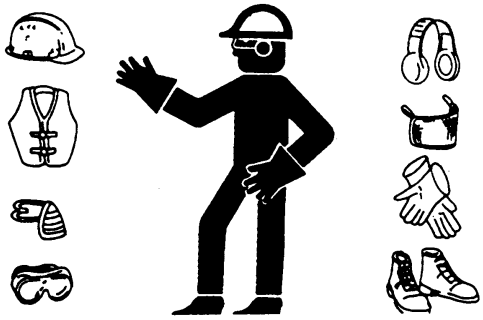
1 PLC #36651

2.4 GENERAL SAFETY

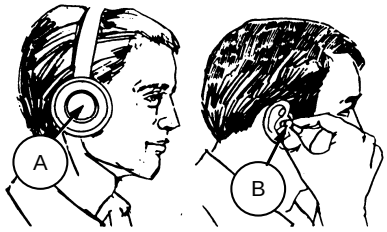
CAUTION

The following are general farm safety precautions that should be part of your operating procedure for all types of machinery:

- **Protect yourself.**
- **When assembling, operating and servicing machinery, wear all the protective clothing and personal safety devices that COULD be necessary for the job at hand. Don't take chances.**
- **You may need:**



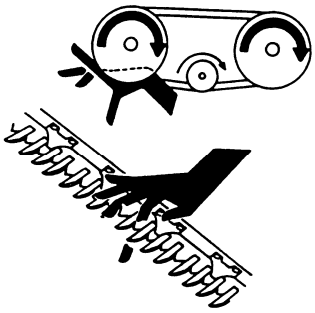
  - **a hard hat.**
  - **protective shoes with slip resistant soles.**
  - **protective glasses or goggles.**
  - **heavy gloves.**
  - **wet weather gear.**
  - **respirator or filter mask.**



  - **hearing protection. Be aware that prolonged exposure to loud noise can cause impairment or loss of hearing. Wearing a suitable hearing protective device such as ear muffs (A) or ear plugs (B) protects against objectionable or loud noises.**

- **Provide a first-aid kit for use in case of emergencies.**
- **Keep a fire extinguisher on the machine. Be sure the extinguisher is properly maintained and be familiar with its proper use.**
- **Keep young children away from machinery at all times.**
- **Be aware that accidents often happen when the operator is tired or in a hurry to get finished. Take the time to consider the safest way. Never ignore warning signs of fatigue.**

- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**



- **Keep hands, feet, clothing and hair away from moving parts. Never attempt to clear obstructions or objects from a machine while the engine is running.**
- **Keep all shields in place. Never alter or remove safety equipment. Make sure driveline guards can rotate independently of the shaft and can telescope freely.**
- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.**

(continued next page)

- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **Stop engine, and remove key from ignition before leaving operator's seat for any reason. A child or even a pet could engage an idling machine.**

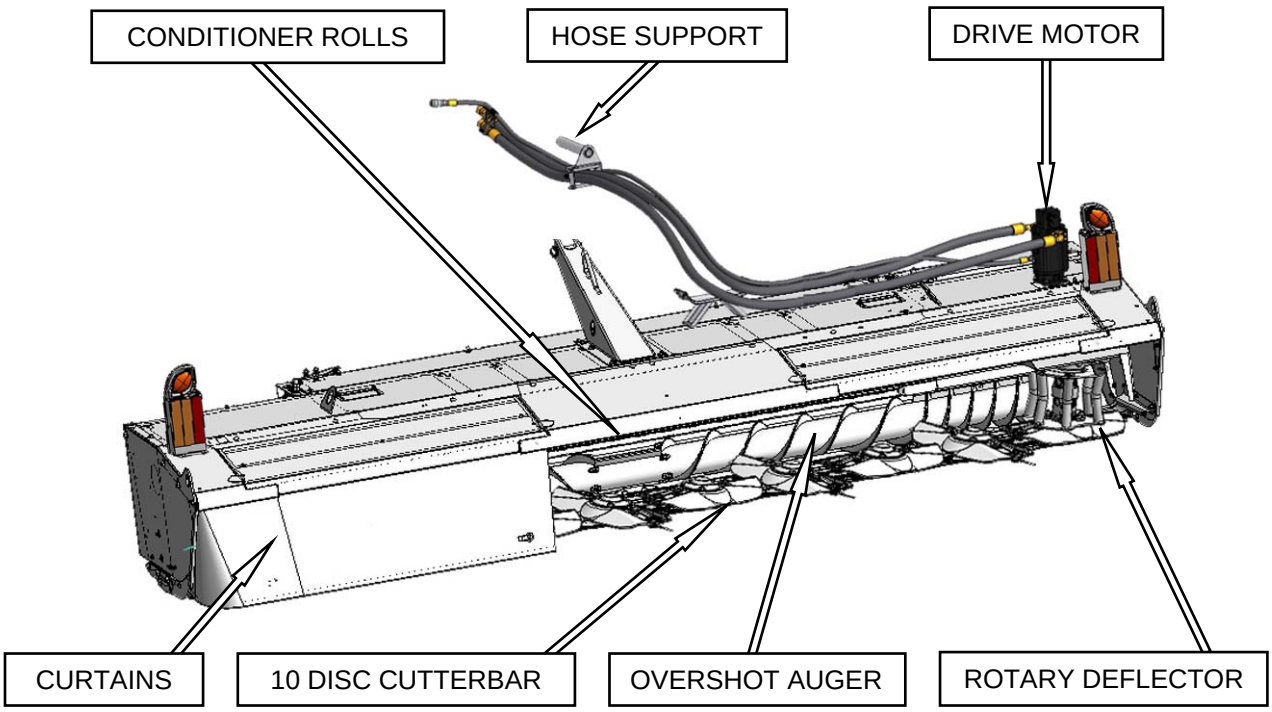
- **Keep the area used for servicing machinery clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**
- **Use adequate light for the job at hand.**
- **Keep machinery clean. Do not allow oil or grease to accumulate on service platforms, ladders or controls. Clean machines before storage.**
- **Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**
- **When storing machinery, cover sharp or extending components to prevent injury from accidental contact.**

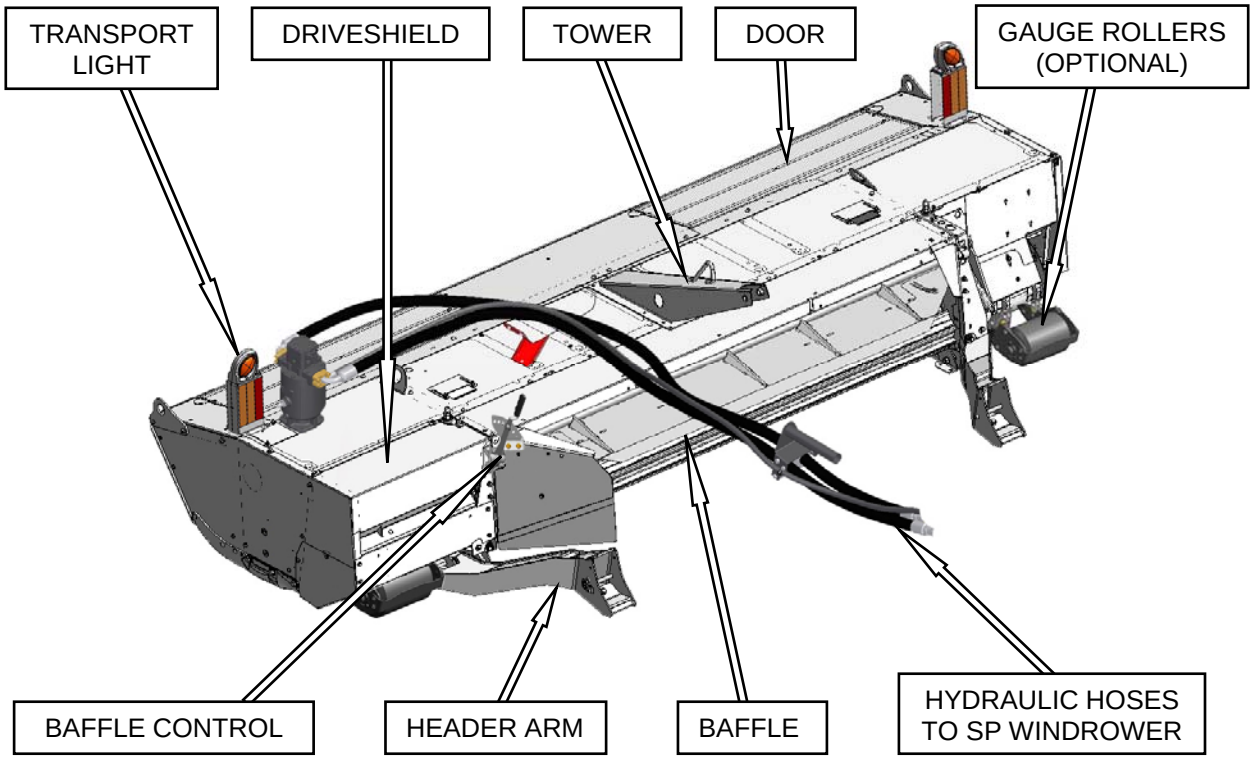
3 DEFINITIONS

TERM	DEFINITION
API	American Petroleum Institute
ASTM	American Society Of Testing And Materials
Cab-Forward	Windrower operation with the operator and cab facing in the direction of travel.
Center-link	A hydraulic cylinder or turnbuckle type link between the header and the machine that tilts the header.
Engine-Forward	Windrower operation with the operator and engine facing in the direction of travel.
Header or Rotary Header	A machine that cuts and conditions hay, and is attached to a windrower.
Mower Conditioner	A machine that cuts and conditions hay, and is pulled by an agricultural tractor.
rpm	Revolutions Per Minute
SAE	Society Of Automotive Engineers
Self-Propelled Windrower	Self-propelled machine consisting of a power unit with a header and conditioner.
Sickle or Knife	A cutting device which uses a reciprocating cutter.
Tractor	Ag type tractor.
Truck	A four-wheel highway/road vehicle weighing no less than 7500 lb (3400 kg).
Windrower	Power unit of a self-propelled auger header.

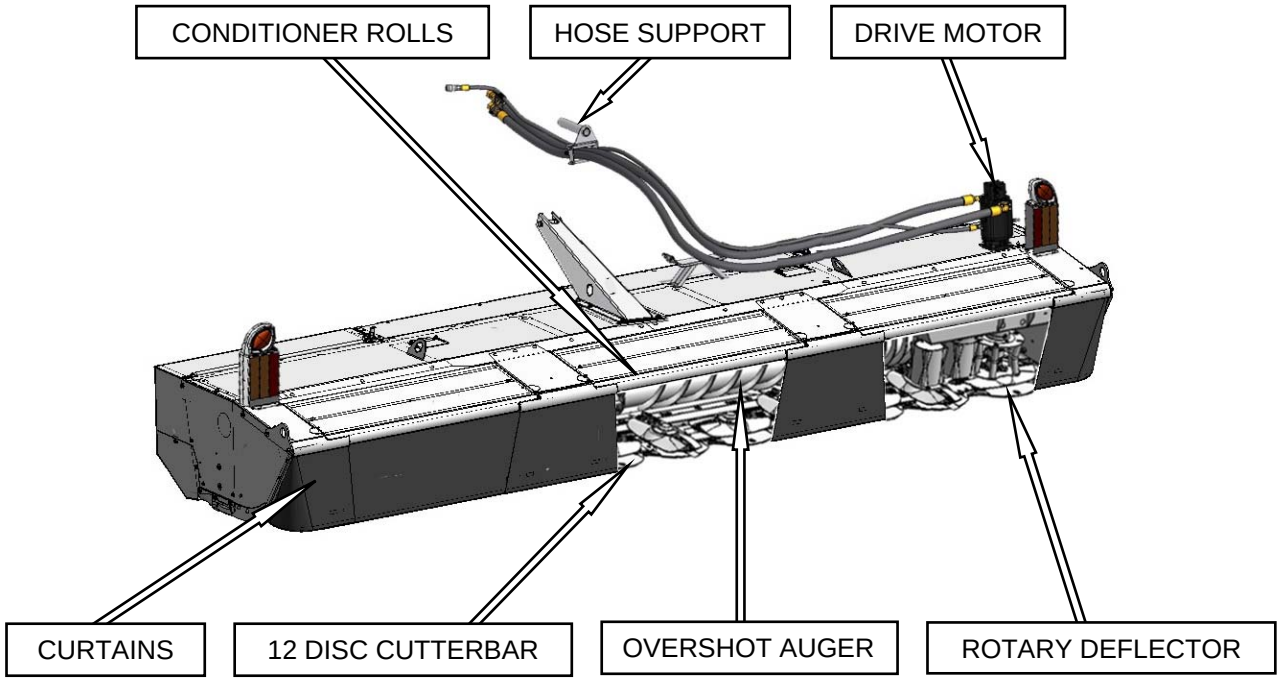
4 COMPONENT IDENTIFICATION

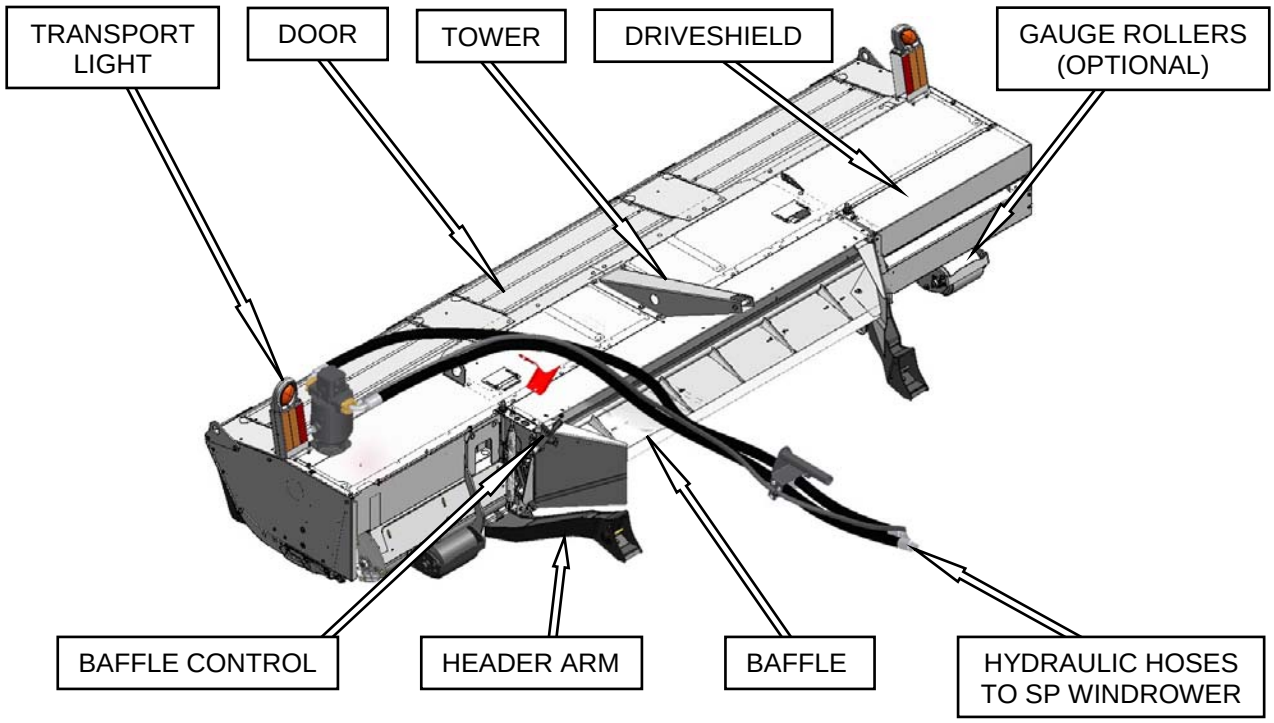
16 FT HEADER





19 FT HEADER


CONDITIONER ROLLS
HOSE SUPPORT
DRIVE MOTOR
CURTAINS
12 DISC CUTTERBAR
OVERSHOT AUGER
ROTARY DEFLECTOR


TRANSPORT LIGHT
DOOR
TOWER
DRIVESHIELD
GAUGE ROLLERS (OPTIONAL)
BAFFLE CONTROL
HEADER ARM
BAFFLE
HYDRAULIC HOSES TO SP WINDROWER

5 SPECIFICATIONS

HEADER MODEL	R85 - 16 FOOT	R85 - 19 FOOT
FRAME AND STRUCTURE		
Transport Width	16 ft-0 in. (4879 mm)	19 ft-4 in. (5887 mm)
Weight (estimated)	4300 lb (1955 kg)	5300 lb (2410 kg)
Carrier	MacDon M200 and M205 SP Windrowers	
Lighting	Two Amber Transport	
Manual Storage	Windrower Cab Manual Storage Compartment	
CUTTERBAR		
Quantity Of Cutting Discs	10	12
Blades Per Disc	Two 18 Degrees Bevel Down Reversible	
Disc Speed	1800 - 2600 rpm	
Blade Tip Speed Range	131 - 189 mph (59.2 - 85.5 m/s)	
Effective Cutting Width	15 ft-10 in. (4827 mm)	19 ft-2 in. (5835 mm)
Cutting Height (Minimum)	0.75 in. (19 mm)	
Lubricant Capacity (Maximum)	4.4 quarts US (4.25 litres)	2.1 quarts US (2.0 liters) per cutterbar
Cutting Angle Range	0 - 8 Degrees Below Horizontal	
Geartrain Protection	Shearable Disc Spindles	
Rotary Deflectors	Two Converging Drum	Six Converging Drum
Gauge Rollers / Skid Shoes (Optional)	Two Adjustable	
OVERSHOT AUGER		
Peripheral Diameter	9.0 in. (229 mm)	
Center Tube Diameter	6.0 in. (152 mm)	
Auger Speed	720 - 1040 rpm	
Drive	Three HB Belts	
DRIVE		
Type	6.4 cu in. (106 cc) Heavy Duty Hydraulic Motor	
Maximum Power Developed	231 hp (174 kW)	
Connections	Direct Coupled (Optional Quick Coupler Connection)	
Normal Operating Pressure	4000 psi (27.58 MPa)	
CONDITIONER		
Drive	Bevel Gearbox To Belt Driven Enclosed Conditioner Timing Gearbox and Driveline	
Bevel Gearbox Lube Capacity	21 oz. (620 ml)	1 quart (1.4 liters)
Conditioner Gearbox Lube Capacity	17 oz. (500 ml)	
Roll Type	Intermeshing Steel Bars	
Roll Diameter	9.17 in. (233 mm) / 6.63 in. (168.4 mm) OD Tube	
Roll Length	118 in. (3000 mm)	
Roll Speed	730 - 1040 rpm	
Swath Width	36 - 102 in. (915 - 2540 mm)	
Forming Shields	Windrower Mounted Adjustable Forming Shield System	
GROUND SPEED	16 mph (25.7 km/h)	

NOTE: 1. Specifications and design are subject to change without notice or obligation to revise previously sold units.

6 OPERATION

6.1 OWNER/OPERATOR RESPONSIBILITIES

CAUTION

- **It is your responsibility to read and understand this manual completely before operating the windrower. Contact your MacDon Dealer if an instruction is not clear to you.**
- **Follow all safety messages in the manual and on safety signs on the machine.**
- **Remember that YOU are the key to safety. Good safety practices protect you and the people around you.**
- **Before allowing anyone to operate the windrower, for however short a time or distance, make sure they have been instructed in its safe and proper use.**
- **Review the manual and all safety related items with all operators annually.**
- **Be alert for other operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.**
- **Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.**
- **The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.**
- **Ensure that the windrower is properly equipped to safely operate the header. This may include adding ballast according to Windrower Operator's Manual requirements for attachments of this size and mass.**

6.2 OPERATIONAL SAFETY

Follow these safety precautions:

CAUTION

- **Follow all safety and operational instructions given in your windrower Operator's Manual. If you do not have a windrower manual, get one from your MacDon Dealer and read it thoroughly.**
- **Never attempt to start the windrower engine or operate the windrower except from the operator's seat.**
- **Check the operation of all controls in a safe clear area before starting work.**
- **Do not allow riders on windrower.**
- **Never start or move the machine until you are sure all bystanders have cleared the area.**
- **Avoid travelling over loose fill, rocks, ditches or holes.**
- **Drive slowly through gates and doorways.**
- **If cutting ditch banks, use extreme caution. If the header hits an obstruction, the front of the windrower will usually swerve towards the ditch.**
- **When working on inclines, travel uphill or downhill when possible.**
- **Never attempt to get on or off a moving windrower.**
- **Do not get off the windrower while the header is in operation.**
- **Stop windrower engine, and remove key before adjusting or removing plugged material from the machine. A child or even a pet could engage the drive.**
- **Check for excessive vibration and unusual noises. If there is any indication of trouble, shutdown and inspect the machine. Follow proper shutdown procedure:**
  - **engage windrower brake.**
  - **turn off engine and remove key.**
  - **wait for all movement to stop.**
  - **dismount and engage lift cylinder stops before inspecting raised machine.**
- **Operate only in daylight or good artificial light.**

(continued next page)

- **Keep everyone several hundred feet away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected from either end with force.**

- **Extreme care must be exercised to avoid injury from thrown objects. Do not, under any circumstances, operate the mower conditioner when other people are in the vicinity. Stones and other objects can be thrown great distances by the rotating cutting blades.**
- **The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep these curtains down when operating the mower conditioner. Replace curtains if they should become worn or damaged.**

6.3 PRE-SEASON CHECK

Perform the following at the beginning of each operating season:

CAUTION

- **Review the Operator's Manual to refresh your memory on safety and operating recommendations.**
- **Review all safety signs and other decals on the header and note hazard areas.**
- **Be sure all shields and guards are properly installed and secured. Never alter or remove safety equipment.**
- **Be sure you understand and have practiced safe use of all controls. Know the capacity and operating characteristics of the machine.**
- **Check the first aid kit and fire extinguisher. Know where they are and how to use them.**

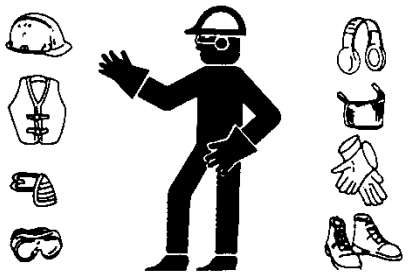
a. Lubricate machine completely. Refer to Section 7.7 LUBRICATION.

b. Perform all annual maintenance. See Section 7.12 MAINTENANCE SCHEDULE.

6.4 DAILY START-UP CHECK

CAUTION

- **Be sure windrower and header are properly attached, all controls are in neutral and windrower brake is engaged.**
- **Clear the area of other persons, pets etc. Keep children away from machinery. Walk around the windrower to be sure no one is under, on or close to it.**
- **Wear close fitting clothing and protective shoes with slip resistant soles.**
- **Remove foreign objects from the machine and surrounding area.**
- **As well, carry with you any protective clothing and personal safety devices that COULD be necessary through the day. Don't take chances.**
- **You may need:**



- **a hard hat.**
- **protective glasses or goggles.**
- **heavy gloves.**
- **respirator or filter mask.**
- **wet weather gear.**
- **Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortable loud noises.**

a. Check the machine for leaks or any parts that are missing, broken, or not working correctly.

NOTE

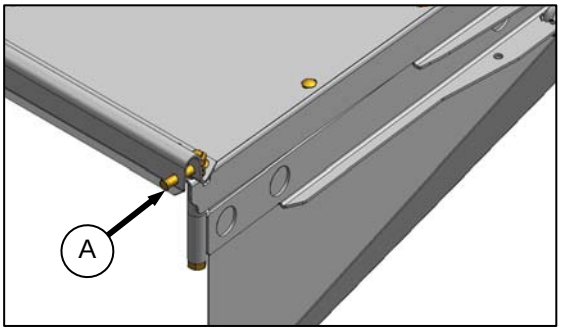
Use proper procedure when searching for pressurized fluid leaks. Refer to Section 7.10 HYDRAULICS.

b. Clean all lights and reflective surfaces on the machine. Check lights for proper operation.

c. Perform all Daily maintenance. Refer to Section 7.12 MAINTENANCE SCHEDULE.

6.5 HEADER ATTACHMENT

a. If not installed, attach the forming shield to the windrower:



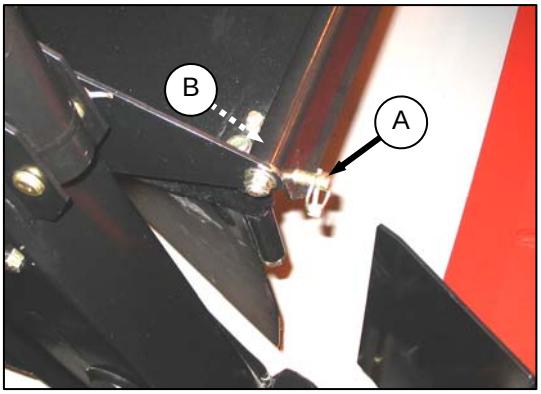
1. Remove the two clevis pins (A) from forming shield forward end.

DANGER

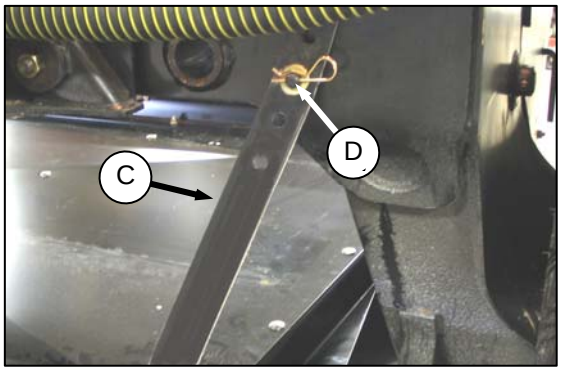
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

2. Stop engine, and remove key.

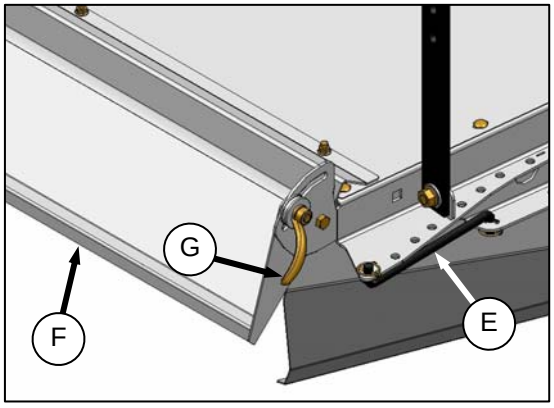
3. Position forming shield under the windrower frame.



4. Locate forming shield onto spacers (B) on windrower legs, and secure with clevis pins (A) and lynch pin.



5. Lift the aft end of the forming shield, and attach straps (C) to pins (D) on windrower frame. Install washer and hairpin to secure strap. Use the “middle” hole, and adjust height to suit the crop.



BOTH SIDES

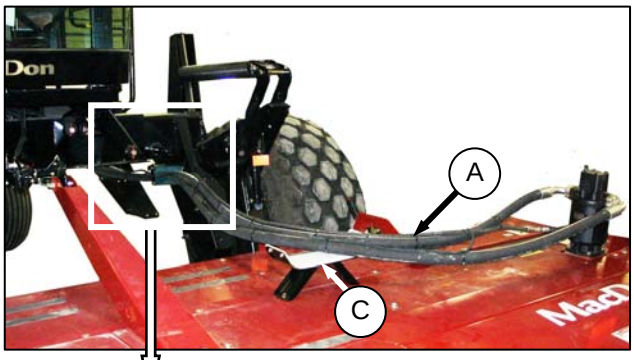
6. Set forming shield side deflectors to desired width by re-positioning adjuster bars (E). Use same hole location on both sides.
7. Adjust fluffer shield (F) to middle position. Loosen handles (G) if required.

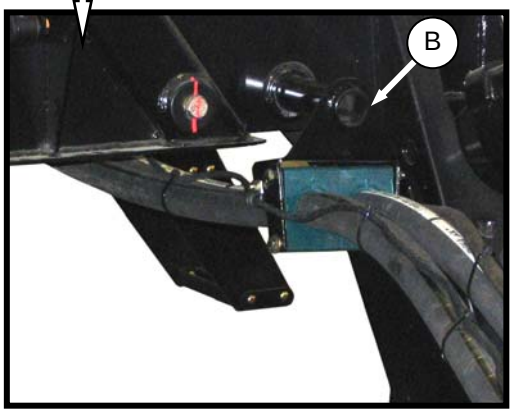
A. M205

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Move windrower left side platform to “open” position.



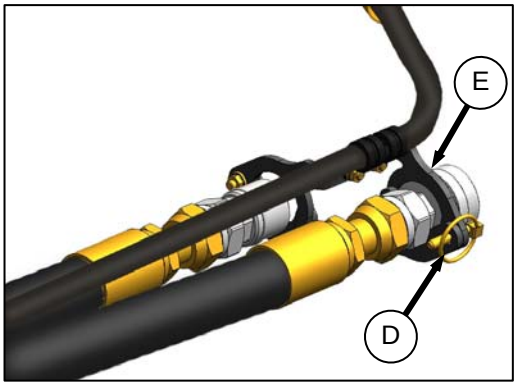


b. Route the hose bundle (A) from the header, under the windrower frame, and insert pin on hose support (B) into hole in windrower frame.

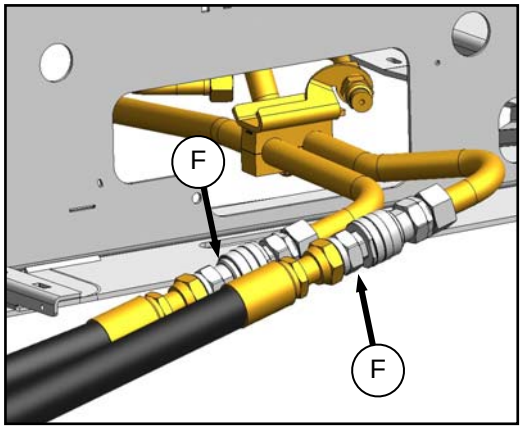
c. Position hoses on support stand (C).

d. If optional couplers and lock are installed on hoses and lines, proceed as follows. Otherwise, proceed to step e.

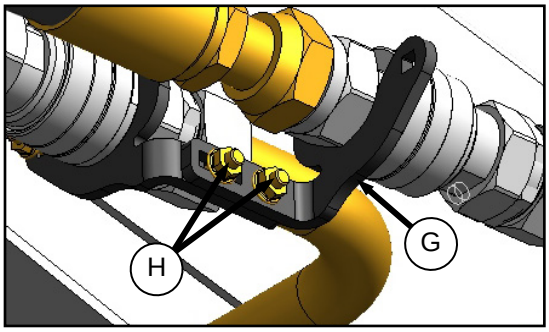
1. If installed, remove coupler lock as follows:



i. Remove lynch pin (D), and open up coupler lock (E).
ii. Remove lock from coupler.

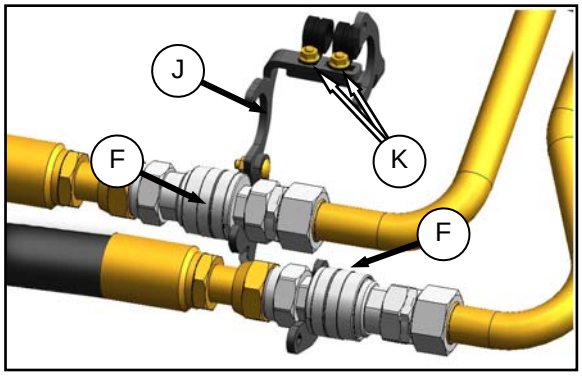


2. Position hose couplers against mating couplers on windrower, and screw sleeves (F) onto mating receptacles.
3. Hand-tighten both coupler sleeves (F).

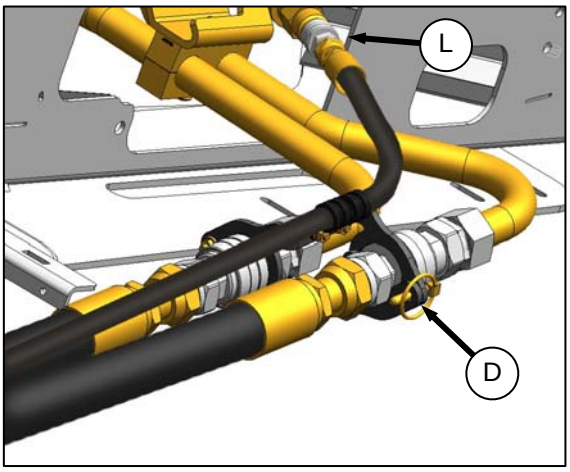


4. Locate lock onto couplers so that retainer (G) locates on fitting adjacent to the sleeve on each coupler. Retainer can be adjusted by loosening bolts (H). Tighten bolts after adjusting.

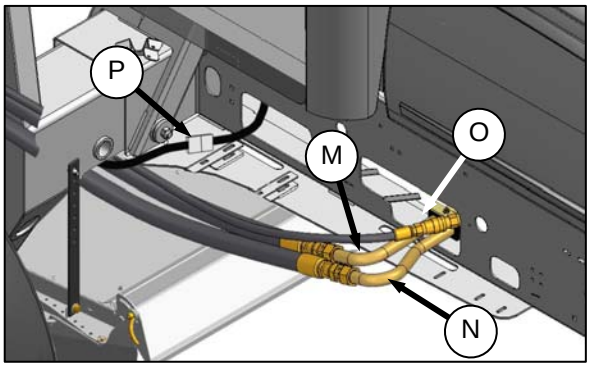
(continued next page)



5. Lower holder (J) onto sleeves (F) so that flats locate on holder. Holder can be adjusted by loosening bolts (K). Tighten bolts after adjusting.



6. Insert lynch pin (D) to secure lock.
7. Remove caps and plugs from the two large hoses and lines.
8. Attach case drain hose coupler at (L).
9. Proceed to step g.



e. Connect large hoses to the lines at (M) and (N) as shown. Torque fittings to 135 ft·lbf (183 N·m).

f. Attach case drain hose coupler at (O).

g. Connect electrical harness to receptacle (G) located beside the forward valve block (not shown), and to the connector on the header.

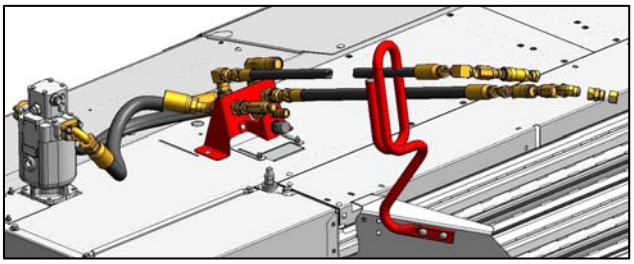
h. Move platform to “closed” position.

B. M200

DANGER

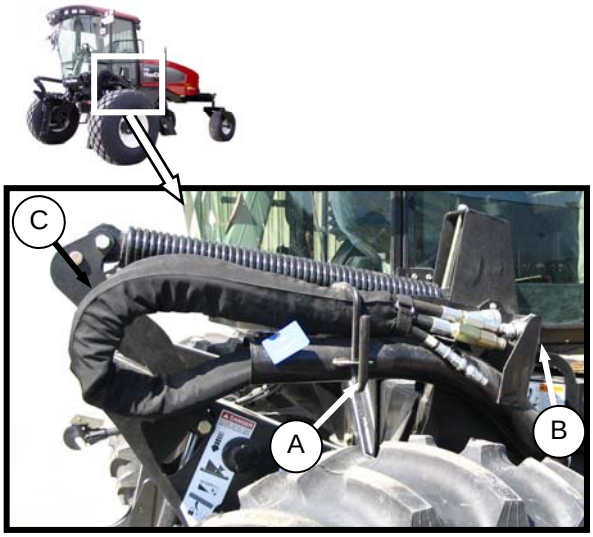
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

The Rotary Header drive requires modification as shown when using an M200 Windrower.



a. If necessary, obtain kit B5455 from your MacDon Dealer, and install it in accordance with the instructions supplied with the kit.

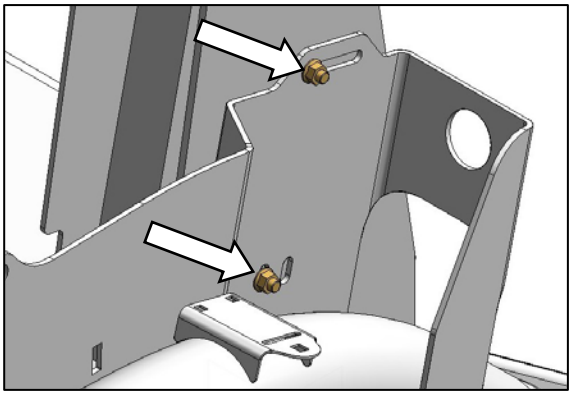
I. WINDROWER CONNECTIONS



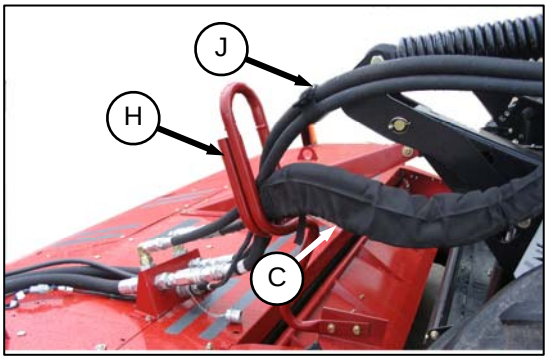
a. Disengage and rotate lever (A) counter clockwise to “fully up” position.

b. Remove cap (B) securing electrical connector to frame.

c. Move hose bundle (C) from windrower, and rest bundle on header.

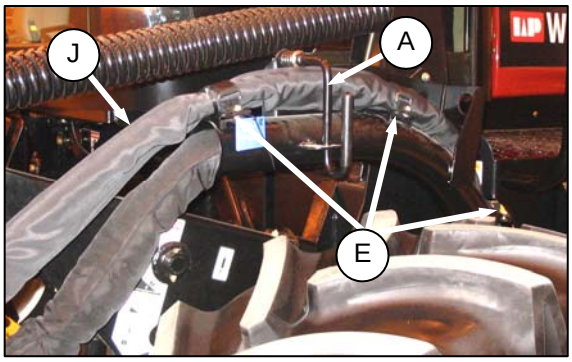


d. Check that hose support is positioned so that lower bolt is in “forward” hole, and support is positioned as shown. Loosen bolts, and adjust as required.



e. Route hose bundle (C) from windrower through support (H) on header.

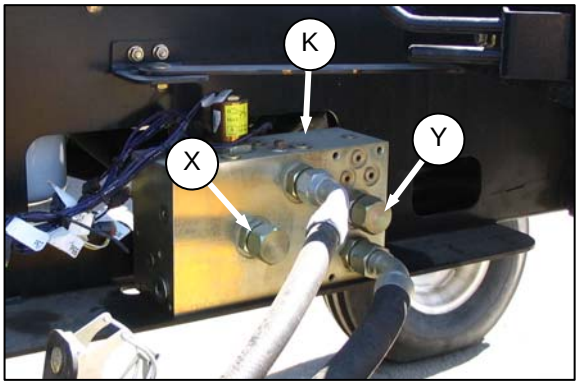
f. Route header return and pressure hose bundle (J) through support (H) on header, to windrower.



g. Locate bundle (J) above existing hose support as shown, and secure with three straps (E).

h. Lower and lock lever (A).

i. Open left side (cab-forward) platform for access to valve blocks.

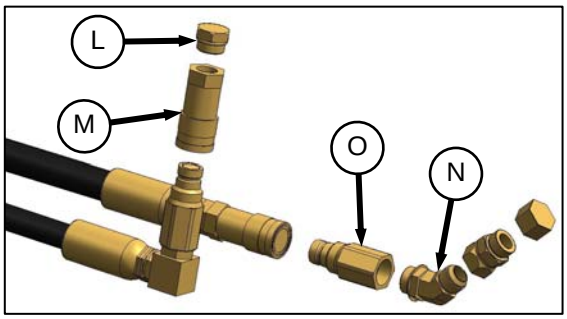


j. Remove caps at ports (X) and (Y) on valve (K), and discard.

IMPORTANT

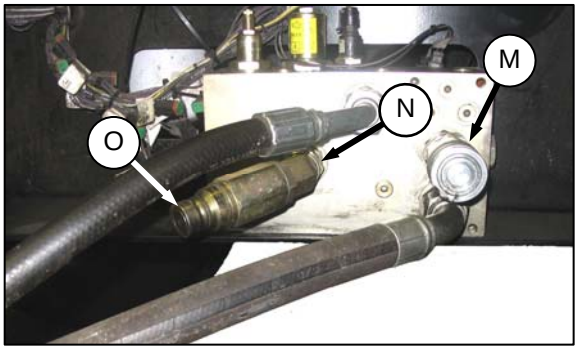
Maintain cleanliness of all open lines and ports.

k. Remove fitting at port (X), and discard.



l. Disconnect fittings at bundle (J) hose ends. Discard caps.

m. Remove O-ring (L) from cap, and install over JIC threads on fitting at port (Y).

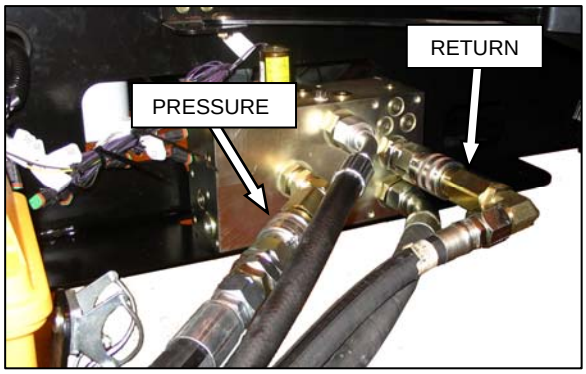


n. Install female coupler (M) from hose in port (Y).

o. Install male 45 degree fitting (N) and male coupler (O) from hose in port (X).

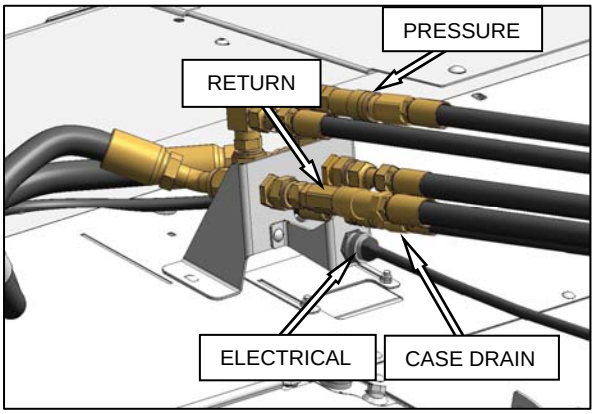
NOTE

Male fitting (N) may need to be disassembled prior to installing on valve block.



p. Connect hoses from header to fittings as shown.

II. HEADER CONNECTIONS



q. Remove caps and plugs from hoses and lines.

r. Connect the pressure, return, and case drain hoses from windrower to fittings on header as shown.

s. Connect electrical harness from windrower to connector on header.

6.6 HEADER DETACHMENT

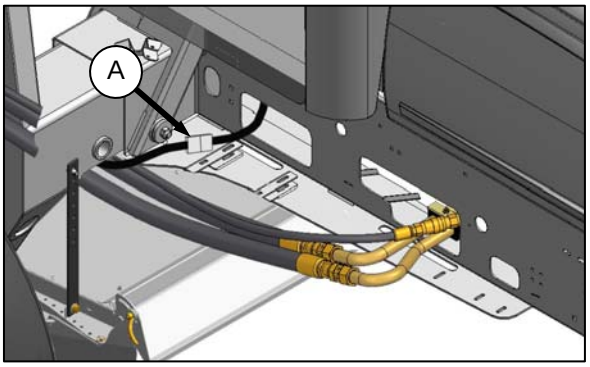
A. M205

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

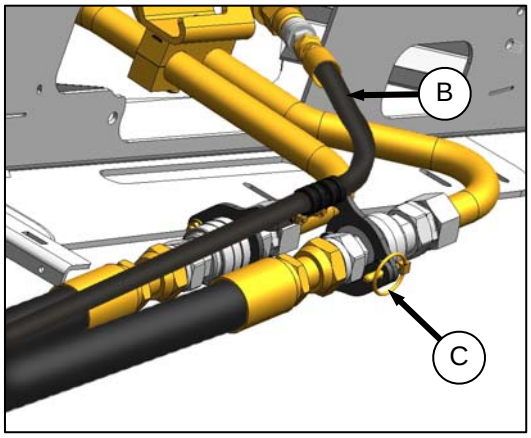
a. Stop engine, and remove key.

b. Move windrower left side platform to “open” position.

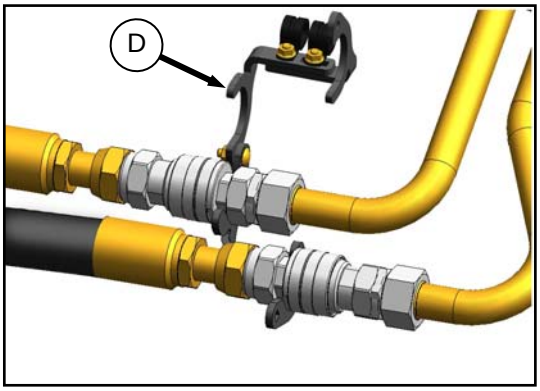


c. Disconnect electrical harness at connector (A).

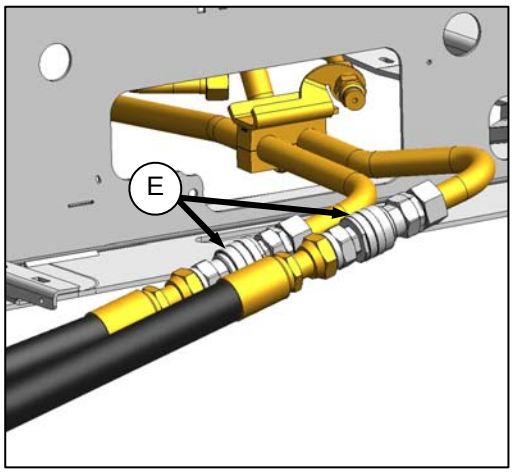
d. If couplers and coupler lock are installed on lines, proceed as follows. Otherwise, proceed to step e.



1. Disconnect ½ inch hose (B) from windrower coupler.

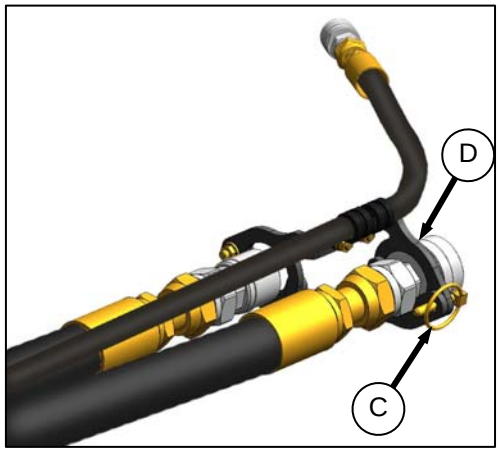


2. Remove lynch pin (C), and open up coupler lock (D).
3. Remove lock from couplers.

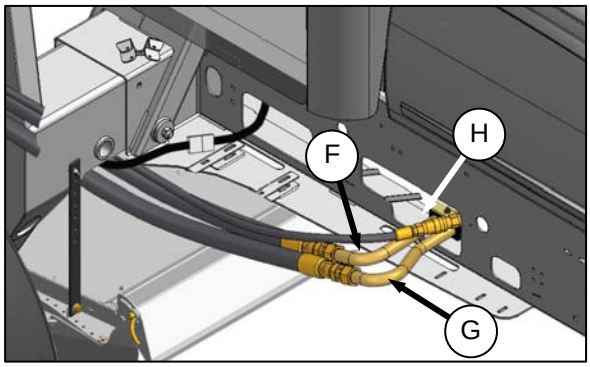


4. Unscrew sleeves (E) on couplers, and separate couplers.
5. Install caps and plugs on open lines.

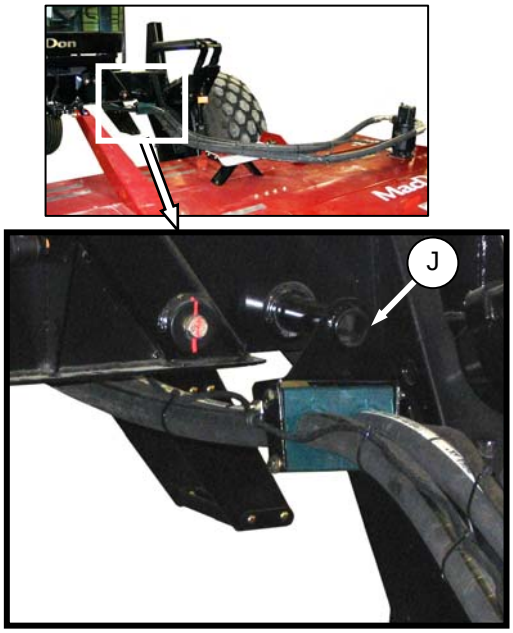
(continued next page)



6. Attach coupler lock (D) to hoses, and secure with lynch pin (C).
7. Proceed to step f.



e. Disconnect hoses from lines (F), (G), and (H) on windrower. Install caps and plugs on open lines.



f. Unhook hose support (J) from windrower, and store hoses on header.

g. Move windrower platform to “closed” position.
h. Detach header from windrower. Refer to your MacDon Self-Propelled Windrower Operator’s Manual.

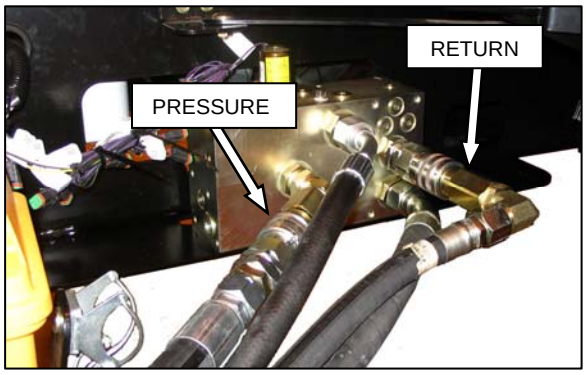
B. M200

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

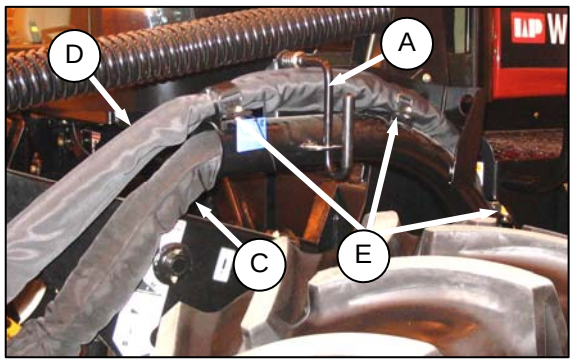
a. Stop engine, and remove key.

b. Move windrower left side platform to “open” position”.



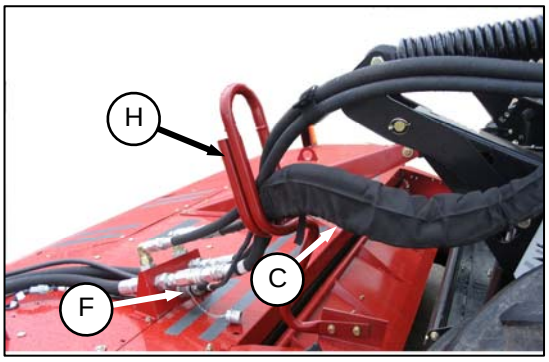
c. Disconnect pressure and return hoses from fittings on valve block.

d. Install plugs and caps on open windrower lines and header hoses.

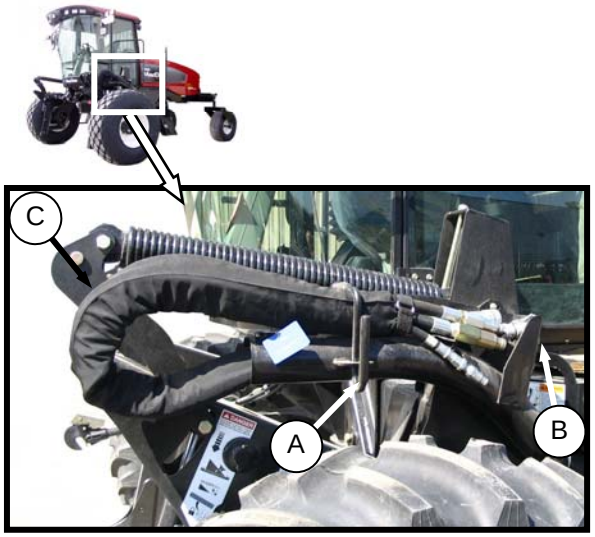


e. Raise and unlock lever (A).

f. Release three cinch straps (E) supporting hose bundle (D), and re-route hose bundle from support to header.



g. Disconnect hoses (C) and electrical harness (F), and pull bundle out of support (H).



h. Route hoses (C) back to windrower, and position above existing hose support as shown.

i. Lower lever (A), and lock it into bracket.

j. Connect electrical plug to cover (B).

k. Move windrower platform to “closed position”

l. Detach header from windrower. Refer to your MacDon Self-Propelled Windrower Operator’s Manual.

6.7 BREAK-IN PERIOD

a. After attaching header to windrower for the first time, operate the machine slowly for 5 minutes, watching and listening carefully FROM THE WINDROWER SEAT for binding or interfering parts.

NOTE

Until you become familiar with the sound and feel of your new header, be extra alert and attentive.

WARNING

Before investigating an unusual sound or attempting to correct a problem, shut off windrower, engage parking brake and remove key.

b. Perform the items specified in 7.12.1 Break-in Inspections.

6.8 SHUTDOWN PROCEDURE

CAUTION

Before leaving the windrower seat for any reason:

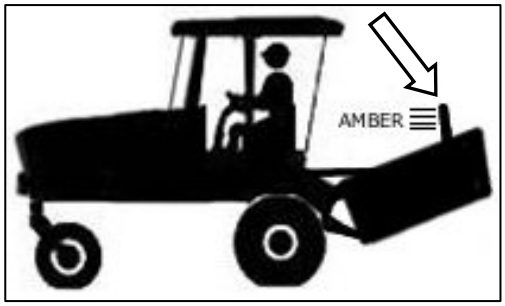
- **Park on level ground if possible.**
- **Lower the header fully.**
- **Place ground speed control in N-DETENT.**
- **Stop engine, and remove key from ignition.**
- **Wait for all movement to stop.**

6.9 TRANSPORTING HEADER

Refer to your MacDon Self-Propelled Windrower Operator's Manual for transporting headers when attached to the windrower.

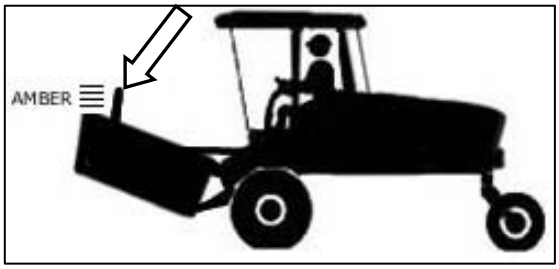
IMPORTANT

Lights are factory assembled to meet road travel lighting requirements with windrower in ENGINE-FORWARD transport mode. If transporting header with header forward, light assemblies must be reversed as shown below.



ENGINE-FORWARD

Ensure the reflector assemblies are properly orientated to suit the mode of transporting the header. The amber deflector must face the direction on travel.



CAB-FORWARD

Refer to the following section for procedures on changing the reflector orientation.

6.9.1 LIGHTS

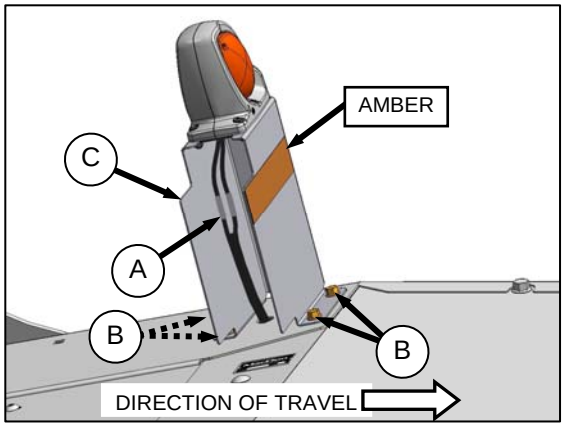
The transport lights, which are mounted on both ends of the header, are activated by switches in the M Series Windrower cab. See your Windrower Operator's Manual on when to use them.

The reflectors can be reversed, depending on the direction of travel. The amber deflector must face the direction of travel.

Change as follows:

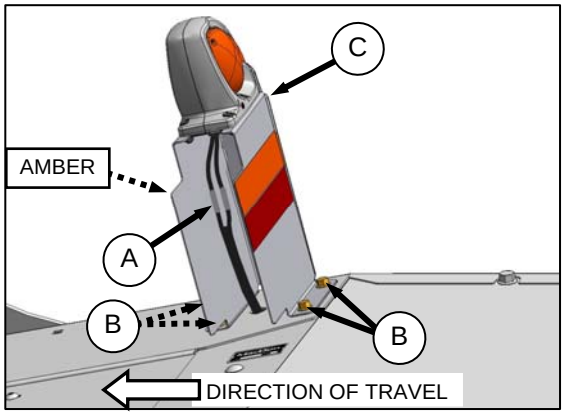
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



FACTORY INSTALLATION

a. Disconnect wiring harness (A) at light.
b. Remove four bolts (B), and remove light assembly (C).
c. Repeat for opposite light assembly.
d. Swap locations of light assemblies.



ALTERNATE INSTALLATION

e. Re-install light assemblies so that amber reflector faces in opposite direction from original installation.
f. Re-install bolts (B), and connect light to wiring harness (A).

6.10 HEADER OPERATION

Satisfactory operation of the header in all situations requires making proper adjustments to suit various crops and conditions.

Correct operation reduces crop loss and increases productivity. As well, proper adjustments and timely maintenance will increase the length of service you receive from the machine.

The variables listed below and detailed on the following pages, will affect the performance of the header.

You will quickly become adept at adjusting the machine to give you the desired results. Most of the adjustments have been set at the factory but if desired, the settings can be changed to suit crop conditions.

VARIABLE	SECTION
Header Float	6.10.1
Roll Gap	6.10.2
Roll Tension	6.10.3
Roll Timing	6.10.4
Forming Shields	6.10.5
Header Angle	6.10.6
Cutting Height	6.10.7
Disc Speed	6.10.8
Ground Speed	6.10.9

6.10.1 Header Float

Header float springs are normally set so that 95 - 105 lbf (426 - 471 N) is required to lift either end of the header “just off” the ground.

In rough or stony conditions, it may be desirable to maintain a lighter setting to protect cutting components.

NOTE

When float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing and leaving a ragged cut. Faster ground speeds may require additional ground pressure.

a. Set the float fine adjustment to mid-range with the windrower float adjustment system in the cab. Refer to your Self-Propelled Windrower Operator’s Manual.

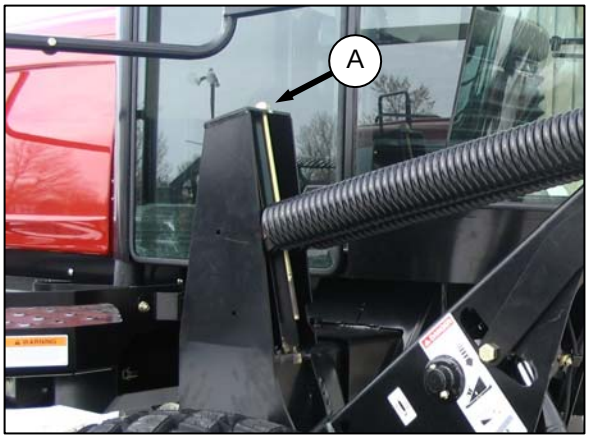
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

b. Check float by grasping the front corner of header and lifting. The force to lift should be 95 - 105 lbf (426 - 471 N), and should be approximately the same at both ends.

c. Perform the following steps to adjust the float (if necessary):

1. Raise the header fully, shutdown the engine, and remove the key.



2. Turn drawbolt (A):
   - clockwise to increase float (makes header lighter), or
   - counter clockwise to decrease float (makes header heavier).
3. Re-check the float.

6.10.2 Roll Gap

Steel rolls "condition" the crop by crimping and crushing the stem in several places. This allows moisture to release for quicker drying. The degree to which the crop is conditioned as it passes through the rolls is controlled by roll gap - that is factory-set at 0.75 inch (19 mm).

Correct conditioning of alfalfa, clover and other legumes is usually indicated when 90% of the stems show cracking, but no more than 5% of the leaves are damaged. Set enough roll gap to achieve this result.

A larger gap (up to 1 inch (25 mm)) may be desirable in thick stemmed cane-type crops. However, too large a gap may cause feeding problems.

Grass type crops may require less gap for proper feeding and conditioning.

IMPORTANT

If settings below the factory setting are used, it is recommended that the actual gap be visually checked.

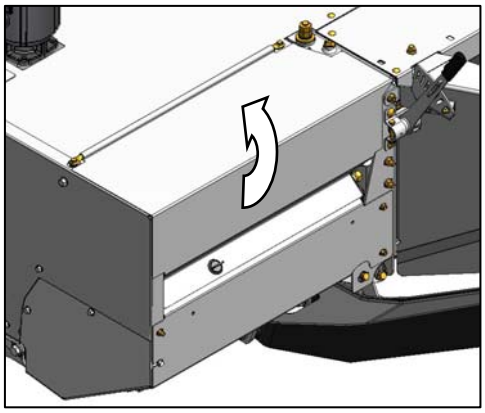
To check roll gap, proceed as follows:

DANGER

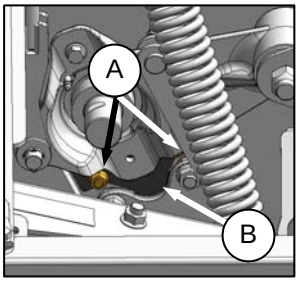
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

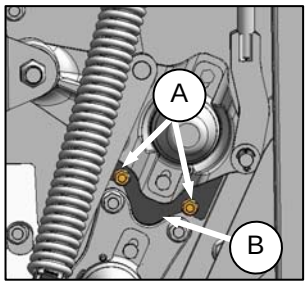
a. Lower header fully.

b. Stop engine, and remove key.

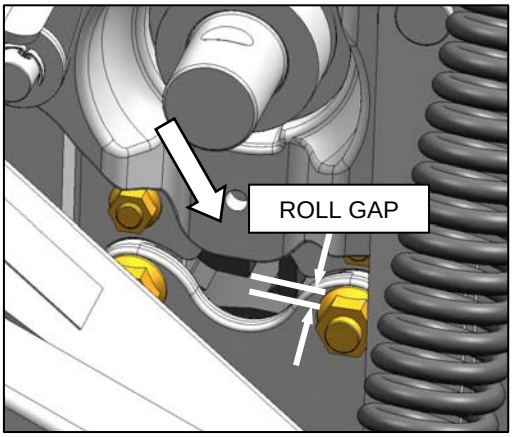


c. Open driveshield at LEFT end of header for a 16 FT header, and at RIGHT end for a 19 FT header. See Section 7.5 DRIVESHIELDS.

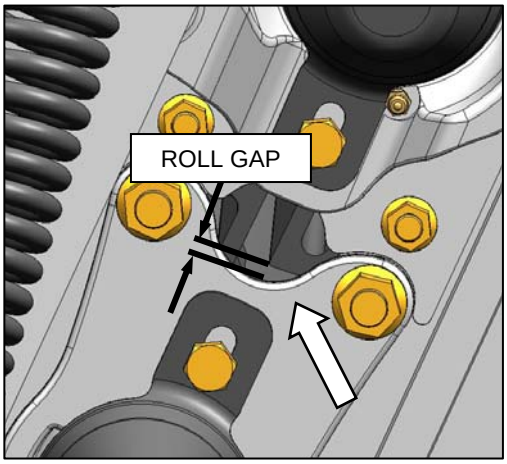




d. At each end of the rolls, loosen nuts (A), and slide cover (B) “upwards” to expose observation hole.



LH END



RH END

e. Check the gap at each end of the rolls to verify setting, and adjust as necessary.

IMPORTANT

Roll timing is critical when the roll gap is decreased because:

- Conditioning is affected, and
- The bars may contact each other.

Refer to Section 6.10.4 Roll Timing.

f. Re-position covers (B), and tighten nuts (A).

g. Close driveshield.

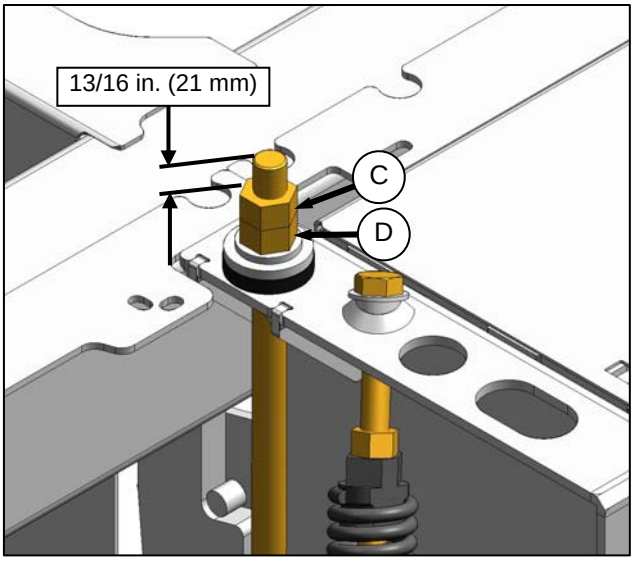
6.10.2.1 Roll Gap Adjustment

a. Lower header fully.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

b. Stop engine, and remove key.



c. Loosen and “back off” upper jam-nut (C), on both sides of conditioner.

d. To increase roll gap, turn lower nut (D) clockwise.

NOTE

The amount of thread protruding through jam-nut should be 13/16 in (21 mm). This equates to 0.75 inch (19 mm) of roll gap.

NOTE

When adjusting roll gap, be sure that the thread protruding is the same on both sides of the conditioner roll to achieve a consistent gap across the rolls.

e. To decrease the roll gap, turn lower nut (D) counter clockwise.

f. Tighten jam-nuts (C), on both sides.

6.10.3 Roll Tension

The roll tension (the force holding the rolls together) is factory-set to maximum, and is adjustable.

Heavy crops or tough forage that tend to separate the rolls require maximum roll tension to ensure that material is sufficiently crimped.

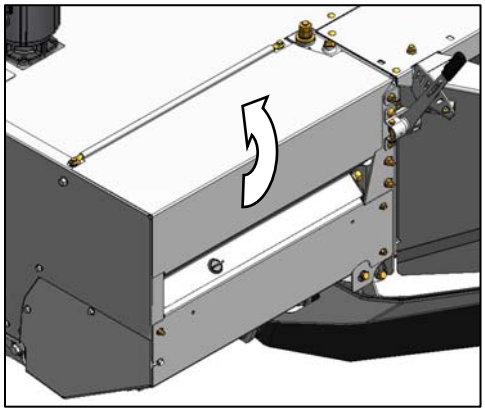
Light alfalfa and short grasses would require less roll tension to lessen over-conditioning.

6.10.3.1 Roll Tension Adjustment

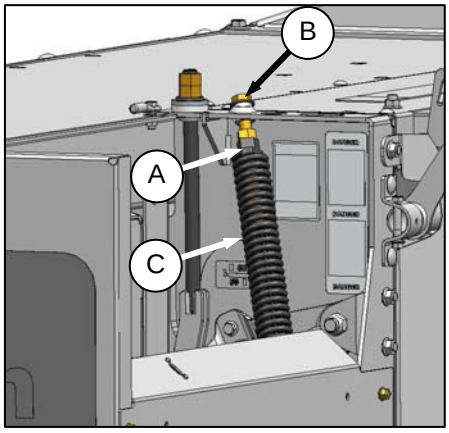
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, shutdown windrower, and remove key.



b. Open driveshield at LEFT end for a 16 FT header, and at RIGHT end for a 19 FT header. See Section 7.5 DRIVESHIELDS.



16 FT LH SHOWN - 19 FT OPPOSITE

c. To increase the roll tension, loosen jam-nut (A), and turn the spring draw-bolt (B) clockwise to tighten the spring (C) at each end of the roll.

d. To decrease the roll tension, turn the spring draw-bolts (B) counter clockwise to loosen the springs.

IMPORTANT

Turn each bolt equal amounts. Each turn of the bolt changes the roll tension by approximately 6.5 lbf (29 N).

e. Tighten jam-nut (A) after adjusting tension.

f. Close driveshield.

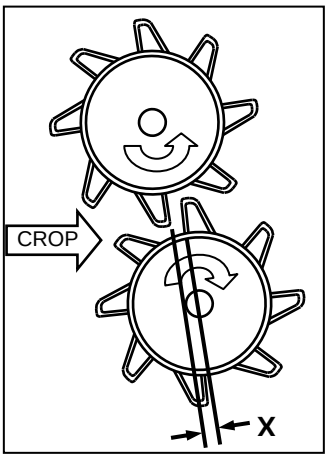
6.10.4 Roll Timing

For proper conditioning, the rolls must be properly timed with each steel bar on one roll centered between two bars of the other roll as shown. The factory setting should be suitable for most crop conditions.

IMPORTANT

Roll timing is critical when the roll gap is decreased because:

- Conditioning is affected, and
- The bars may contact each other.



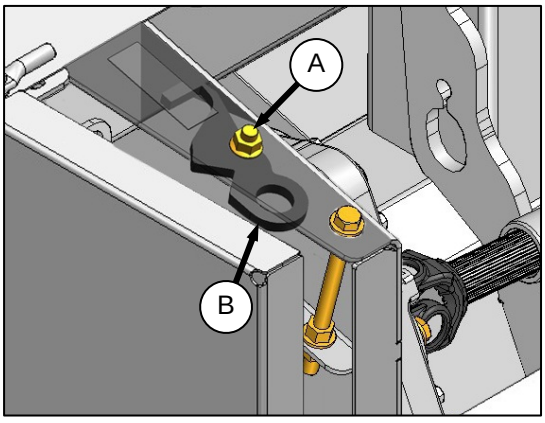
To check roll timing '**X**', proceed as follows:

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

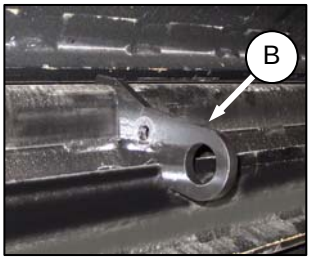
a. Lower header fully, stop engine, and remove key.

b. Open driveshield at LEFT end for a 16 FT header, and at RIGHT end for a 19 FT header. See Section 7.5 DRIVESHIELDS.

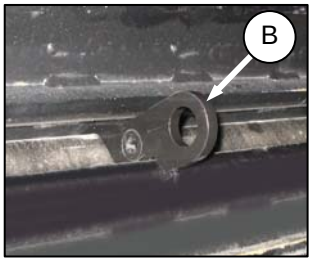


16 FT SHOWN - 19 FT OPPOSITE

c. Loosen bolt (A), and retrieve sheet gauge (B) from flanged frame member.



START POSITION

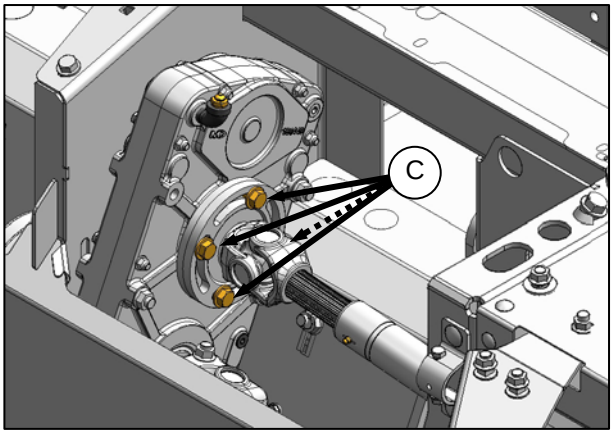


GAUGE POSITION

d. From the rear of the header, locate gauge (B) at centre of rolls as shown, and manually turn rolls to limits of gauge. Rolls will engage the gauge if timing is correct.

6.10.4.1 Roll Timing Adjustment

Adjust roll timing, if necessary, as follows:



16 FT SHOWN - 19 FT OPPOSITE

a. Loosen four bolts (C) in slots of yoke plate on upper roll universal shaft.

b. Position gauge at centre of rolls, and manually turn the rolls to engage the gauge. The rolls will automatically adjust to the correct timing.

c. Tighten bolts (C) to secure the position.

d. Turn the rolls manually to release gauge.

CAUTION

To ensure gauge is not forcibly ejected from rolls when machine is started, ensure gauge is securely re-attached to frame.

e. Store gauge (B) on frame member under the flange with bolt (A) and nut.

6.10.5 Forming Shields

WARNING

Keep everyone several hundred feet away from your operation. Ensure bystanders are never in line with the front or rear of the machine. Stones or other foreign objects can be ejected from either end with force.

The position of the forming shields controls the width and placement of the windrow. The decision on forming shield position should be based on the following factors:

- weather conditions (rain, sun, humidity, wind),
- type and yield of crop,
- drying time available, and
- method of processing (bales, "green-feed", silage).

A wider windrow will generally dry faster and more evenly, resulting in less protein loss.

Fast drying is especially important in areas where the weather allows only a few days to cut and bale. Refer to Section 6.11 HAYING TIPS for more information.

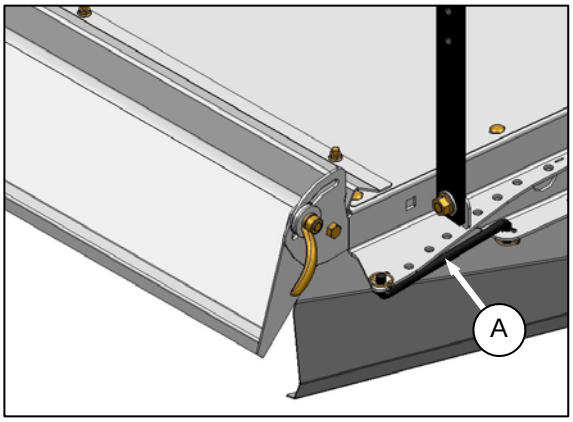
Where weather conditions permit or when drying is not critical, for example, when cutting for silage or "green-feed", a narrower windrow may be preferred for ease of pick-up.

6.10.5.1 Side Deflectors

The position of the side forming shields controls the width and placement of the windrow.

DANGER

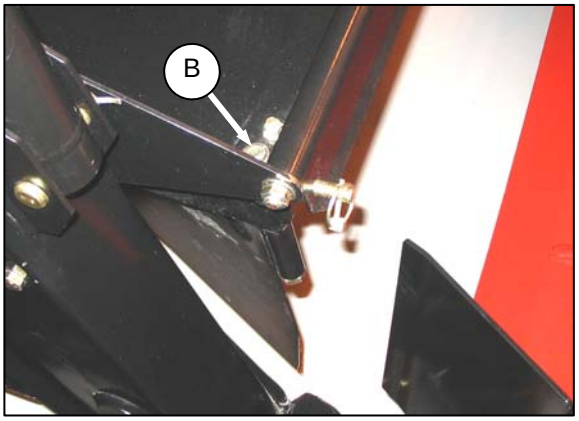
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



BOTH SIDES

a. Set forming shield side deflectors to desired width by re-positioning adjuster bars (A) in holes in forming shield cover.

   To ensure windrow placement is centered, adjust both side deflectors to the same position.



b. If side deflector attachment is too tight or too loose, tighten or loosen nut (B) as required.

(continued next page)

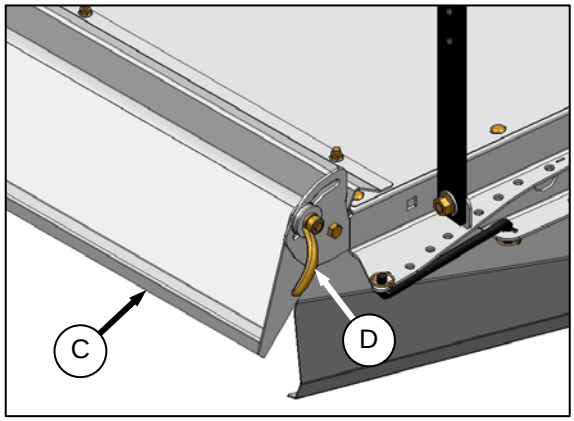
6.10.5.2 Rear Deflector (Fluffer Shield)

The rear deflector slows the crop exiting the conditioner rolls, directs the flow downward, and "fluffs" the material.

Adjust the deflector as follows:

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



BOTH SIDES

a. For more crop control in light material, lower the deflector (C) by pushing “down” on one side of the deflector, and then on the other side.

NOTE

Locking handles (D) are located at either end of the deflector, and may be loosened slightly.

b. For heavier crops, raise the deflector by pulling “up” on one side, and then on the other side.

NOTE

For even windrow formation, be sure the deflector is not twisted.

c. Tighten handles (D) to secure deflector position.

6.10.5.3 Baffle

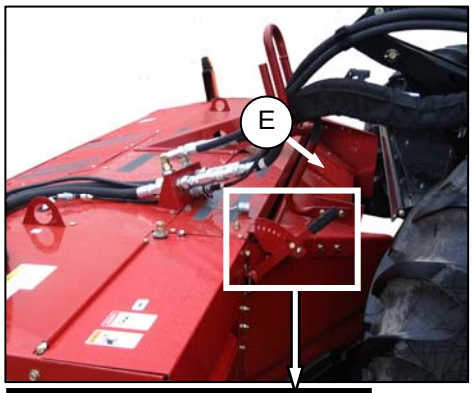
The baffle (E) determines the width and height of the windrow. It is located immediately behind and above the conditioning rolls, and can be positioned to:

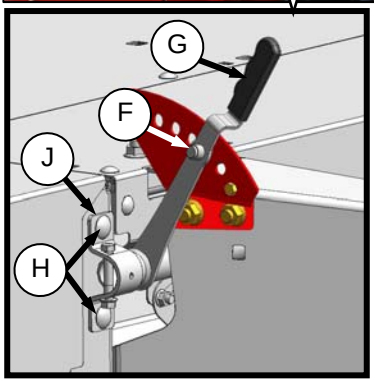
- Direct the crop flow into the forming shield for narrow and moderate width windrows.
- Direct crop downward to form a wide swath.

Adjust the baffle as follows:

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.





a. Remove lynch pin from pin (F), and remove pin from lever (G).

b. Move lever to “middle” hole in bracket, and re-install pin (F) through lever and bracket.

c. Secure with lynch pin.

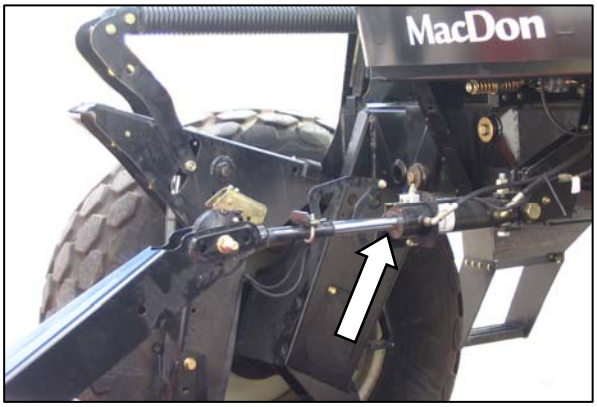
NOTE

Baffle position may need to be adjusted for proper pin engagement. Loosen bolts (H), and adjust bracket (J) and baffle as required. Tighten bolts (H).

6.10.6 Header Angle

Header (or cutterbar) angle can be varied from 0 - 8° below horizontal. Choose an angle that maximizes performance for your crop and field conditions.

A flatter angle provides better clearance in stony conditions, while a steeper angle is required in down crops for better lifting action.



The header angle can be hydraulically adjusted from the windrower cab using hydraulic cylinder without shutting down the windrower. Refer to your MacDon Self-Propelled Windrower Operator's Manual.

6.10.7 Cutting Height

Cutting height is determined by a combination of the angle of the cutterbar/header, and the roller gauge or skid shoe settings.

Cutting height should be adjusted for optimum cutting performance without allowing excessive build-up of mud and soil inside the header that can lead to poor crop flow and increased wear on cutting components.

Choose an angle that maximizes performance for your crop and field conditions. Refer to Section 6.10.6 Header Angle.

Optional adjustable gauge rollers or skid shoes are available to also provide different cutting heights. See the following sections - 6.10.7.1 Gauge Roller Height Adjustment and 6.10.7.2 Skid Shoe Height Adjustment - for additional information.

- Lowering the skid shoes/gauge rollers or decreasing header angle increases the cutting height. This may be desirable in stony conditions, to reduce damage to cutting components. Also, a longer stubble length helps material dry faster.
- Raising the skid shoes/gauge rollers and increasing header angle allows the crop to be “shaved”.

To minimize damage to cutterbar components, scooping soil, or soil build-up at the cutterbar in damp conditions, header float should be set as light as possible without causing excessive bouncing.

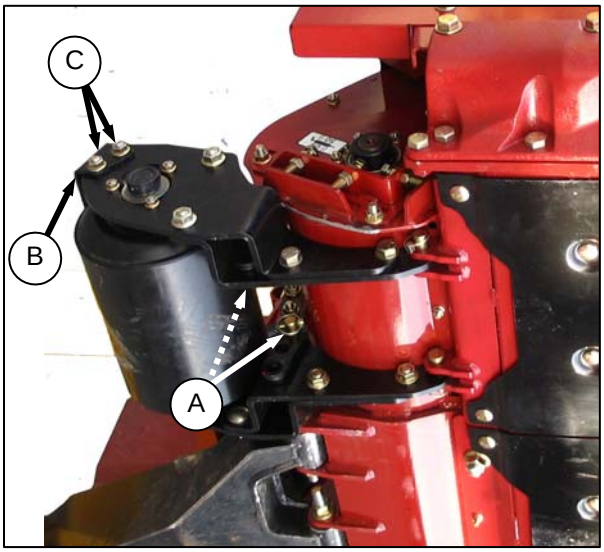
When the float setting is light, it may be necessary to use a slower ground speed to avoid excessive bouncing and leaving a ragged cut.

6.10.7.1 Gauge Roller Height Adjustment

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage header lift cylinder stops before going under machine for any reason.

a. Raise header fully, stop engine, and remove key. Engage header lift cylinder stops.



b. Remove lynch pin, and remove adjuster pin (A) from one side of roller.
c. Hold roller, and remove lynch pin and adjuster pin (A) from other side. Position roller at desired position, and re-install adjuster pins (A). Secure with lynch pins.
d. Repeat for roller at opposite end of header.
e. Adjust mud bar (B) by loosening nuts (C), and then re-tighten to maintain minimum clearance between mud bar and roller.

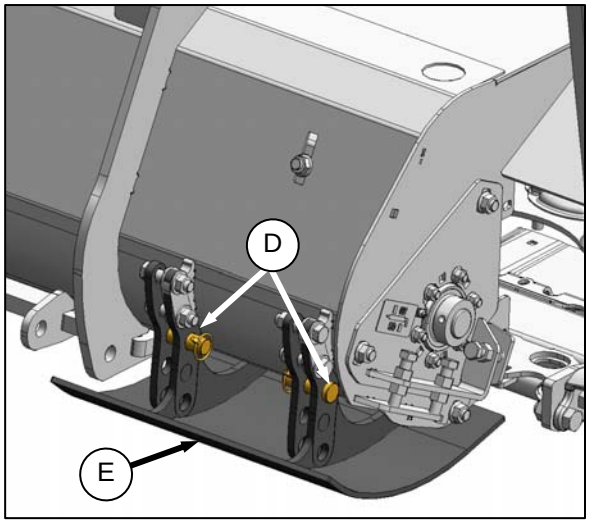
6.10.7.2 Skid Shoe Height Adjustment

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage header lift cylinder stops before going under machine for any reason.

a. Raise header fully, stop engine, and remove key.

b. Engage header lift stops.



c. Remove lynch pin, and remove adjuster pin (D) from one side of skid shoe (E).

d. Hold skid shoe, and remove lynch pin and adjuster pin (D) from other side. Position shoe at desired position, and re-install adjuster pins (D). Secure with lynch pins.

e. Repeat for skid shoe at opposite end of header.

6.10.8 Disc Speed

The disc header can be used to cut a variety of crops and for the best cutting results, a range of disc speeds is recommended for each type of crop and condition.

See table below.

CROP	CONDITION	DISC RPM
Alfalfa	Heavy	2300 - 2500
	Light	1600 - 2000
Sudan, Sorghum, Haygrazer, Timothy	Tall and Stemmy	2300 - 2500
Short Grass	Dense	2500
	Thin	1800 - 2000

Disc speeds are set and adjusted from the cab using system controls, without shutting down the windrower. Refer to your MacDon Self-Propelled Windrower Operator's Manual.

6.10.9 Ground Speed

CAUTION

Reduce speed when turning, crossing slopes, or when travelling over rough ground.

a. Choose a ground speed that allows the cutterbar and conditioner to cut the crop smoothly and evenly. Try different combinations of header speed and ground speed to suit your specific crop. Refer to your MacDon Self-Propelled Windrower Operator's Manual for changing ground speed.

b. In tough cutting conditions, such as native grasses, the disc speed will need to be increased.

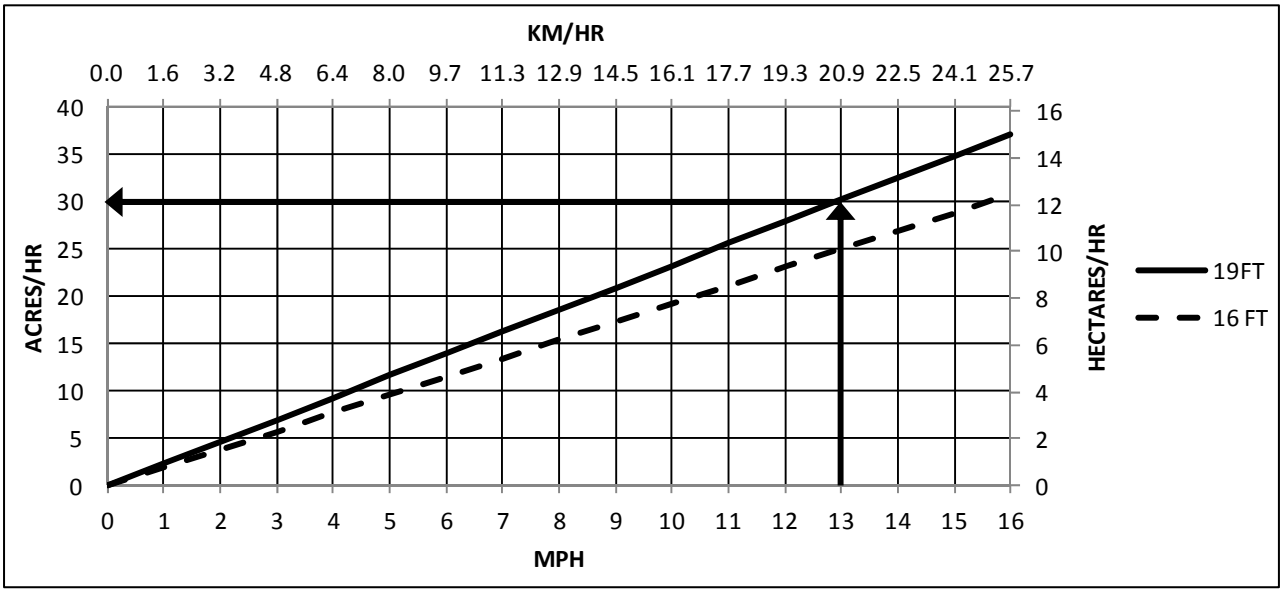
c. In light crops, the header speed can be reduced while maintaining ground speed.

NOTE

Operating the header at the minimum disc speed will extend the wear life of cutting components.

d. The chart below indicates the relationship between ground speed and area cut for 16 and 19 FT header sizes.

Example shown: At ground speed of 13 mph (21 km/h) with a 19 FT header, the area cut would be approximately 30 acres (12 hectares) per hour.



6.10.10 Auger

The overshot auger is designed to feed the cut crop from the cutterbar into the conditioner rolls.

The vertical and fore-aft positions of the auger can be adjusted to suit the crop conditions for optimal movement of the crop, to minimize wrapping, and to keep the cutterbar clear.

The auger flighting should never contact the pan or stripper bars.

The auger position has been factory-set, and should not normally require adjustment.

For fine stemmed crop, the auger performs best when set as close as possible to the pan and stripper bars without rubbing. This is especially important in grass and other crops which have a tendency to wrap.

Component wear may cause clearances to become excessive, resulting in feeding problems and uneven windrows.

6.10.10.1 Auger Adjustment

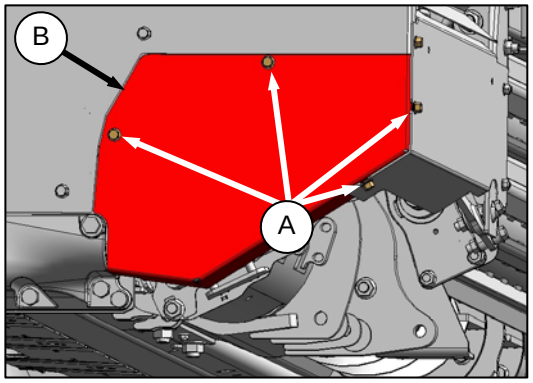
If necessary, adjust the auger position as follows:

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

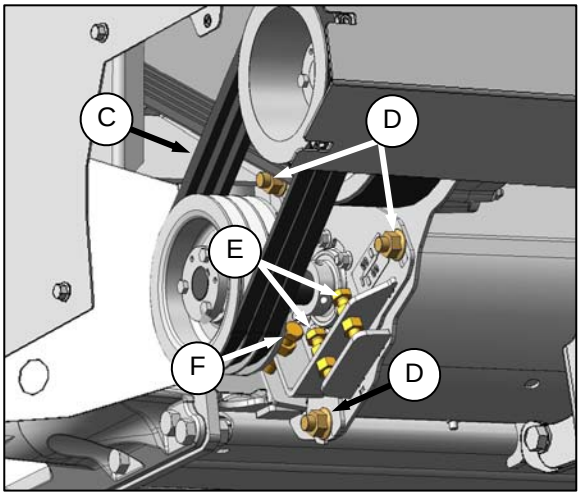
a. Raise header to full height, shutdown windrower, and remove key.

b. Engage windrower lift cylinder locks.



16 FT SHOWN - 19 FT OPPOSITE

c. Remove four bolts (A), and remove shield (B).



d. Loosen auger drive belts (C) at the left end of header. Refer to Section 7.9.2 Auger Drive Belts.

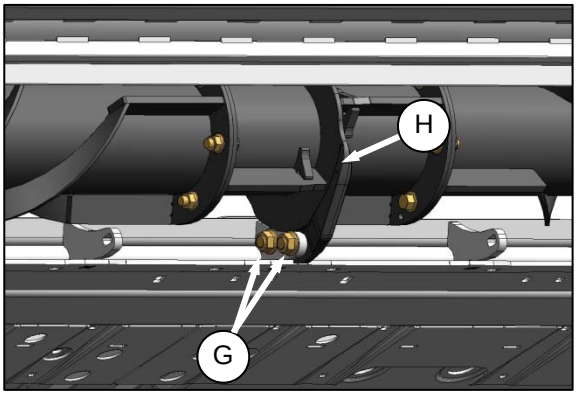
e. Loosen three nuts (D).

f. To adjust vertical position, loosen upper nuts on adjuster bolts (E). Hold lower nut, and turn adjuster bolts (E) to set auger vertical position from bottom of pan.

g. To adjust fore-aft position, loosen aft nut on adjuster bolt (F). Hold forward nut, and turn adjuster bolt (F) to set auger so that it clears the back of the pan.

h. Tighten the three nuts (D), and then the jam-nuts on adjuster bolts (E) and (F).

i. Repeat above steps e. to h. at opposite end of auger.

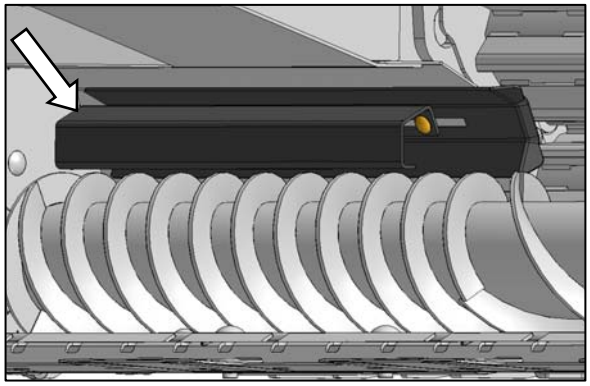


j. To adjust the center support, loosen bolts (G). Adjust auger support (H) “fore” or “aft”, and “vertical” position as required. Tighten bolts (G).

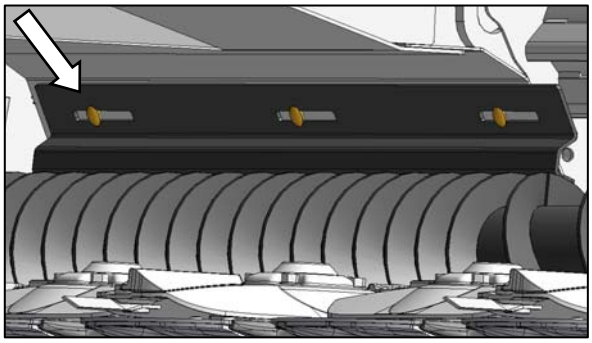
k. Check clearance to stripper bars.

l. Tighten auger drive belts (C). Refer to Section 7.9.2 Auger Drive Belts.

6.10.11 Stripper Bars



16 FT (RH SHOWN - LH OPPOSITE)



19 FT (RH SHOWN - LH OPPOSITE)

There are two adjustable stripper bars installed on the pan at both ends of the auger that minimize wrapping of material around the auger.

The stripper bar position has been factory-set, and should not normally require adjustment.

For fine stemmed crop, the auger performs best when the stripper bars are positioned as close as possible to the auger without rubbing. Component wear and cutting in bumpy terrain where the auger can contact the stripper bar, may cause clearances to become excessive, resulting in feeding problems and uneven windrows.

If material starts to accumulate between the auger flighting and the strippers, the gap will need to be adjusted.

NOTE

The stripper bars will likely require adjustment if the auger position is changed.

6.10.11.1 Stripper Bar Adjustment - 16 FT

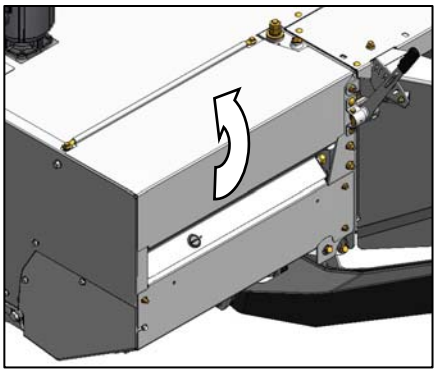
If necessary, adjust as follows:

DANGER

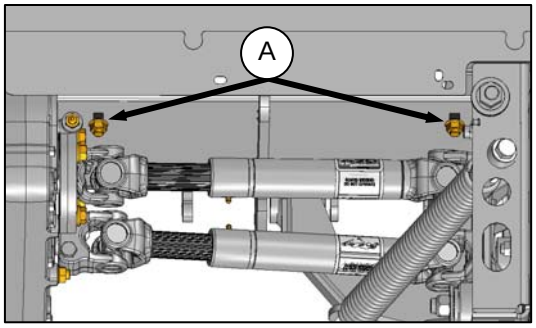
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, shutdown windrower, and remove key.

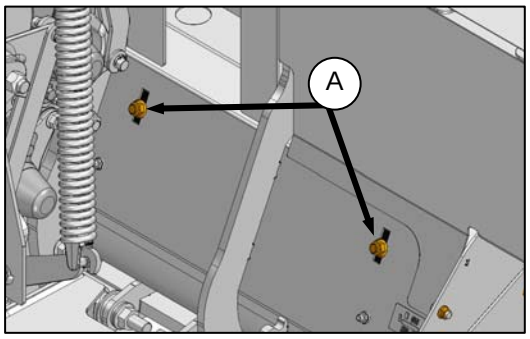
b. Open cutterbar doors.



c. Open driveshield on left end of header. See Section 7.5 DRIVESHIELDS.



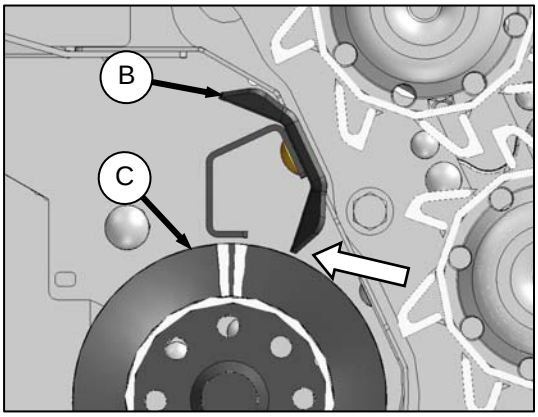
LEFT END



RIGHT END

d. Loosen nuts (A) on the two bolts securing stripper bar to pan, sufficiently so that stripper bar can be moved.

(continued next page)



e. Position stripper bar (B) as close as possible to auger flighting (C) without contacting it.

f. Repeat above steps d. to g. for opposite side

g. Manually rotate auger to check that auger does not contact stripper bars. Re-adjust as required.

h. Tighten nuts (A).

NOTE

Right side and left side stripper bars are interchangeable. Each stripper bar can be flipped when one bar wears out or becomes damaged.

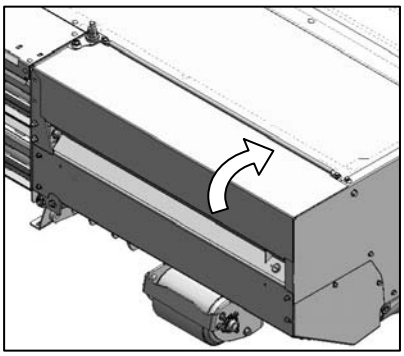
6.10.11.2 Stripper Bar Adjustment - 19 FT

If necessary, adjust as follows:

DANGER

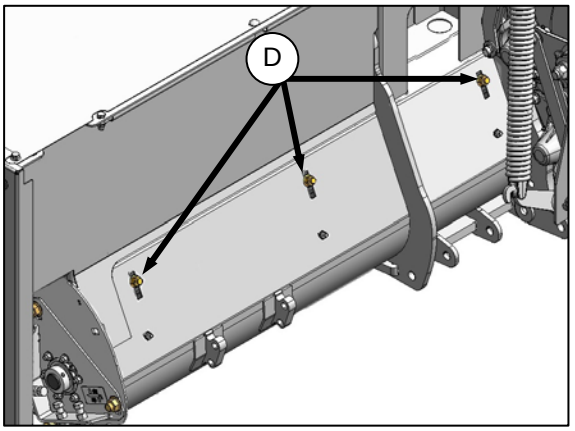
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, shutdown windrower, and remove key.

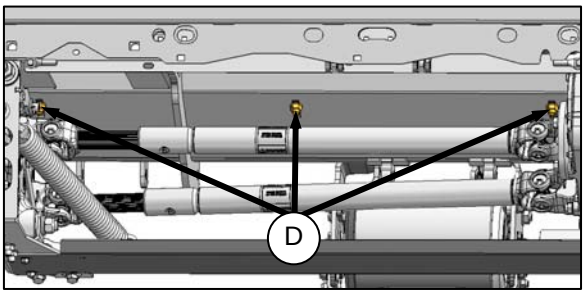


b. Open cutterbar doors.

c. Open driveshield on RIGHT end of header. See Section 7.5 DRIVESHIELDS

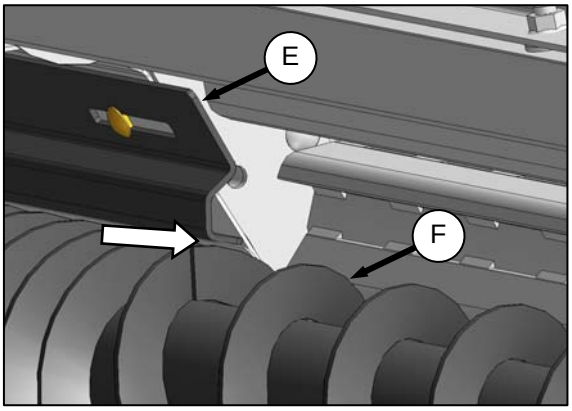


LEFT END



RIGHT END

d. Loosen nuts (D) on the three bolts securing stripper bar to pan sufficiently so that stripper bar can be moved.



e. Position stripper bar (E) as close as possible to auger flighting (F) without contacting it.

f. Repeat above steps d. to g. for opposite side

g. Manually rotate auger to check that auger does not contact stripper bars. Re-adjust as required.

h. Tighten nuts (D).

NOTE

Right side and left side stripper bars are interchangeable. Each stripper bar can be flipped when one bar wears out or becomes damaged.

6.10.12 Double Windrowing

If your windrower is equipped with the Double Windrow Attachment (DWA), refer to MacDon M Series Windrower Double Windrow Attachment Manual (Form 169216) for operating and maintenance instructions.

The manual is shipped with the DWA Kit.

See Section 9.5 DOUBLE WINDROW ATTACHMENT.

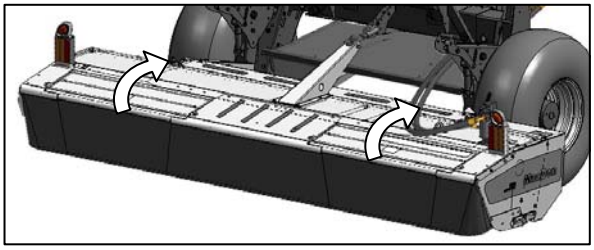
6.10.13 Tall Crop Dividers

The tall crop dividers (one on each end of header) assist in clean crop dividing and cutterbar entry in tall crops. They are <u>not</u> adjustable but can easily be removed as follows:

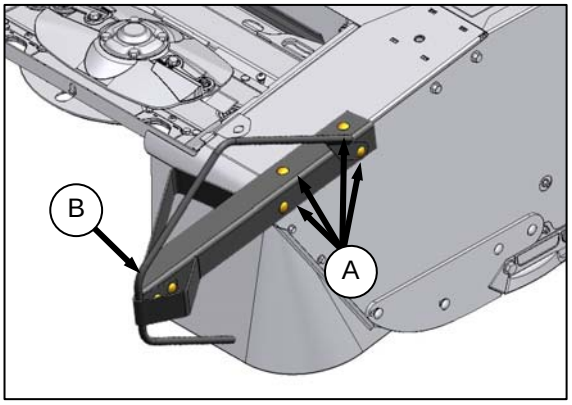
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

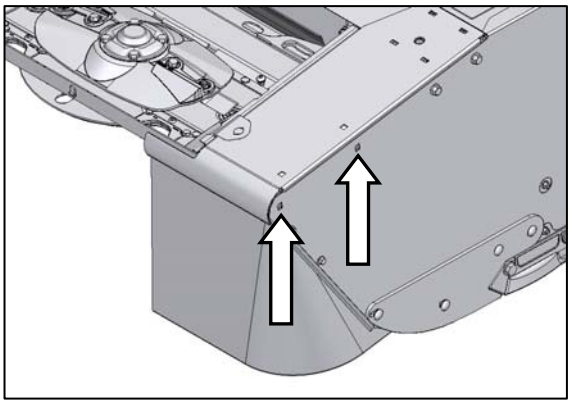
a. Lower header to ground, shutdown windrower, and remove key.



b. Open cutterbar doors.



c. Remove the four bolts (A) and nuts. Remove deflector (B).

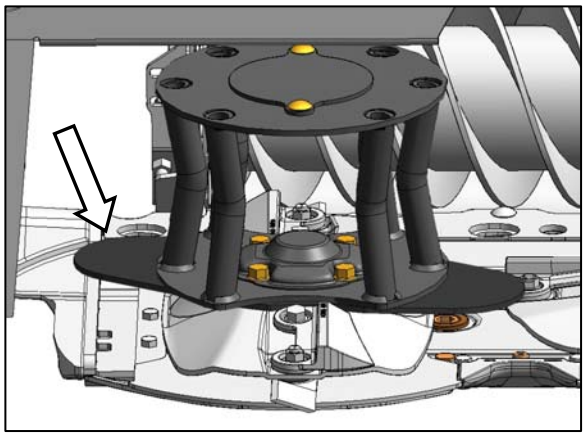


d. Re-install two bolts and nuts at locations shown.

e. Repeat above steps at other end.

f. Close cutterbar doors.

6.10.14 Tall Crop Feed Plates



The tall crop feed plates assist the feeding of tall crops into the conditioner by encouraging material flow from behind the cage deflectors.

They will degrade the cutting performance of the cutterbar if they are used in medium to light alfalfa, and so should not be installed in those types of crops.

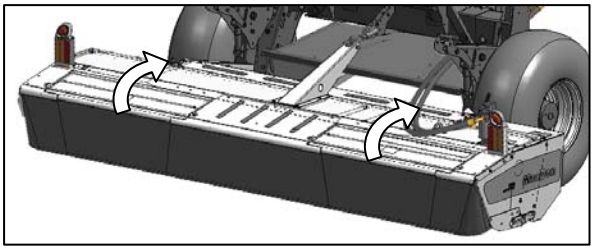
The feed plates are designed for installation on the two cage deflectors, and only on 16 FT headers. They are stored inside the RH side drive compartment.

DANGER

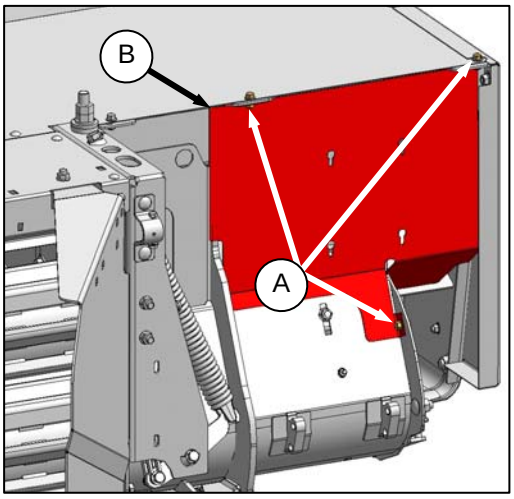
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

6.10.14.1 Installation

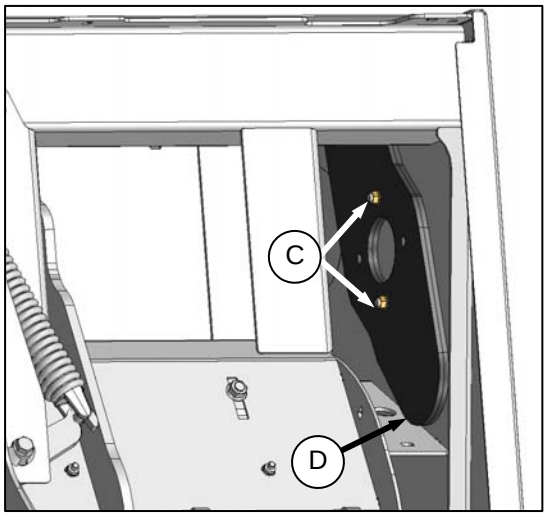
a. Lower header to the ground, shut off engine and remove key from ignition.



b. Open cutterbar doors.



c. Remove three bolts (A) and remove RH side drive compartment shield (B).



d. Remove nuts (C) securing feed plates (D) to side of compartment, and remove plates.

e. Re-install drive shield (B) with bolts (A).

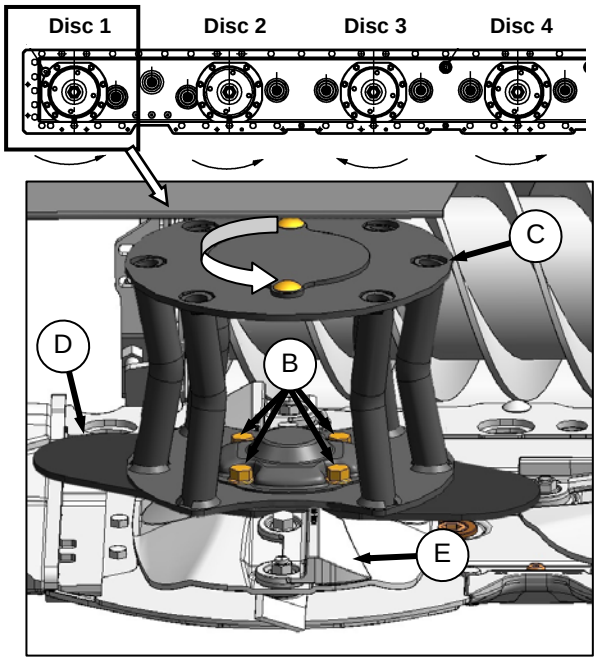
CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

f. Place a block of wood between discs to prevent deflector from turning.

(continued next page)

Driven Deflector - RH End



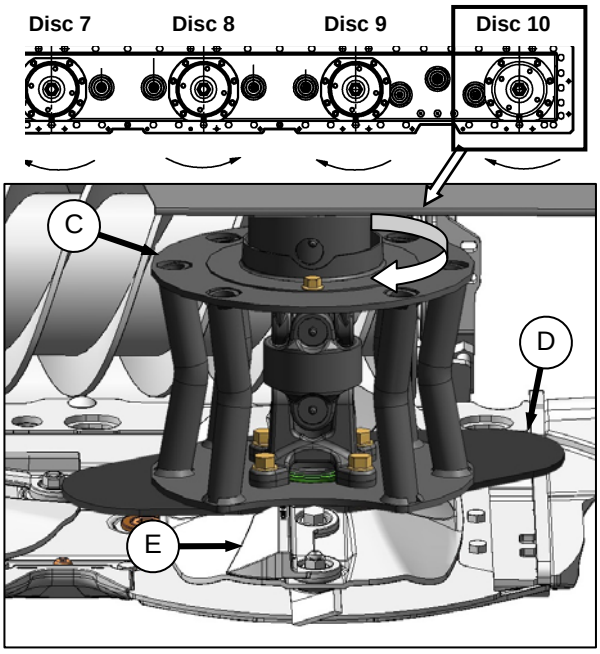
COUNTER CLOCKWISE ROTATION
RH DRIVEN DISC

1. Remove four bolts (B), and remove driven cage deflector (C) at RH end of cutterbar.
2. Locate feed plate (D) on the disc, ensuring that hole in feed plate registers on disc. Position plate approximately as shown, and align holes.

   IMPORTANT

   Feed plate should be located so that when holes are aligned, the leading edge of the feed plate (D) is further from the accelerator (E) than the trailing edge.
3. Re-position deflector (C), and align holes.
4. Re-install bolts (B), and tighten to 92 ft·lbf (125 N·m).

Driveline Deflector - LH End



CLOCKWISE ROTATION
LH DRIVELINE DISC

1. Remove driveline cage deflector (C). Refer to the Technical Service Manual.
2. Locate feed plate (D) on the disc, ensuring that hole in feed plate registers on disc. Position plate approximately as shown, and align holes.

   IMPORTANT

   Feed plate should be located so that when holes are aligned, the leading edge of the feed plate (D) is further from the accelerator (E) than the trailing edge.
3. Re-install cage deflector. Refer to the Technical Service Manual.

g. Remove block of wood (if used).

h. Manually rotate discs to check for interference of feed plate and adjacent parts.

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

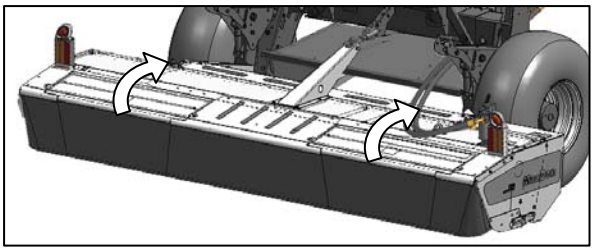
i. Close cutterbar doors.

6.10.14.2 Removal

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to the ground, shut off engine and remove key from ignition.



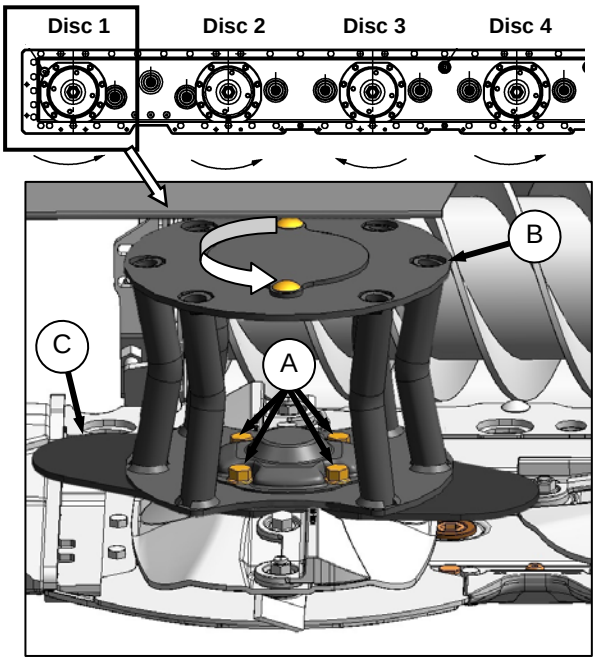
b. Open cutterbar doors.

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

c. Place a block of wood between discs to prevent deflector from turning.

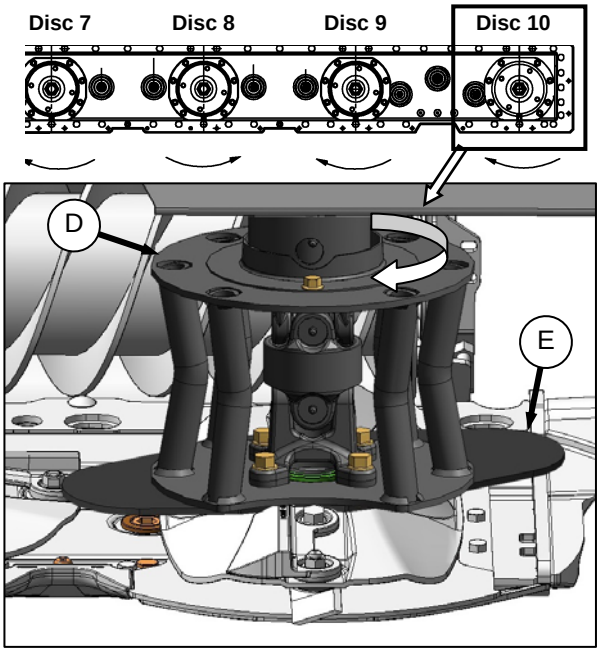
Driven Deflector - RH End



COUNTER CLOCKWISE ROTATION
RH DRIVEN DISC

1. Remove four bolts (A), and remove driven cage deflector (B) at RH end of cutterbar.
1. Remove feed plate (C).
2. Re-position deflector (B), and align holes.
3. Re-install bolts (A), and tighten to 92 ft·lbf (125 N·m).

Driveline Deflector - LH End



CLOCKWISE ROTATION
LH DRIVELINE DISC

1. Remove driveline cage deflector (D). Refer to the Technical Service Manual.
2. Remove feed plate (E)
3. Re-install cage deflector (D). Refer to the Technical Service Manual.

d. Remove block of wood (if used).

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

e. Close cutterbar doors.

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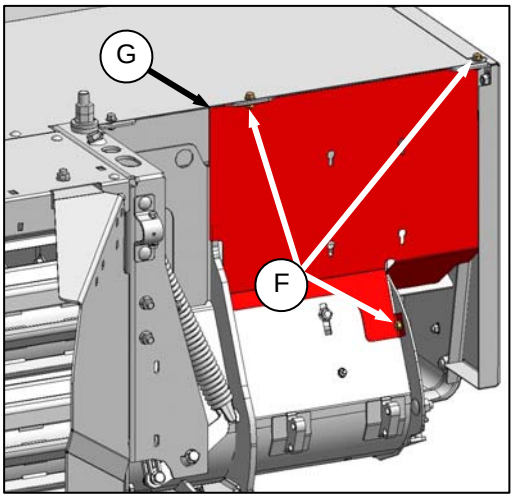
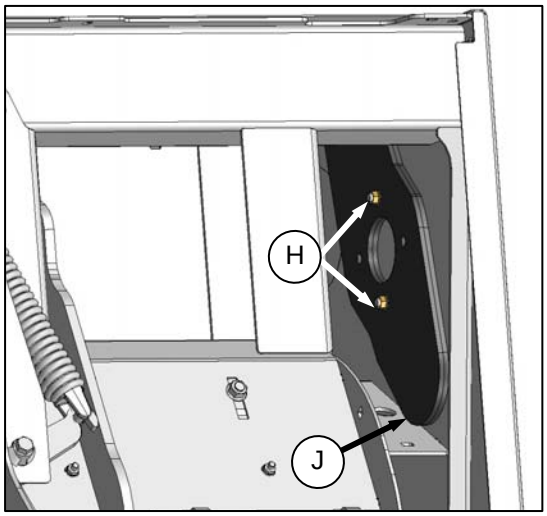


f. Remove three bolts (F), and remove RH side drive compartment shield (G).



g. Remove nuts (H) from studs in storage compartment.

h. Secure feed plates (J) to side of compartment with nuts (H).

i. Re-install drive shield (G) with bolts (F).

6.11 HAYING TIPS

6.11.1 Curing

a. A quick cure will maintain top quality because:
   - Protein is lost for each day hay lies on the ground.
   - The sooner the cut hay is harvested, the earlier the start for next growth.

b. Leaving the windrow as wide and thin as possible makes for the quickest curing.

c. The cured hay should be baled as soon as possible.

6.11.2 Topsoil Moisture

a. On wet soil, the general rule of "wide and thin" does not apply. A narrower windrow will dry faster than hay left flat on wet ground.

b. When the ground is wetter than the hay, moisture from the soil is absorbed by the hay above it. Determine topsoil moisture level before cutting. Use a moisture tester or estimate level:

LEVEL	% MOISTURE	CONDITION
Wet	Over 45	Soil is Muddy
Damp	25 - 45	Shows Footprints
Dry	Under 25	Surface is Dusty

c. If ground is wet due to irrigation, wait until soil moisture drops below 45%.

d. If ground is wet due to frequent rains, cut when weather allows and let the forage lie on wet ground until it dries to the moisture level of the ground.

e. The cut hay will dry no more until the ground under it dries, so consider moving the windrow to drier ground.

6.11.3 Weather and Topography

a. Cut as much hay as possible by midday, when drying conditions are best.

b. Fields sloping south get up to 100% more exposure to the sun's heat than do north sloping fields. If hay is baled and chopped, consider baling the south facing fields and chopping those facing north.

c. When relative humidity is high, the evaporation rate is low, and hay dries slower.

d. If there is no wind, saturated air becomes trapped around the windrow. Raking or tedding will expose the hay to fresher, less saturated air.

e. Cutting hay perpendicular to the direction of the prevailing winds is also recommended.

6.11.4 Windrow Characteristics

It is recommended that a windrow with the following characteristics be produced. Refer to Section 6.10 HEADER OPERATION for instructions on adjusting the header.

CHARACTERISTIC	ADVANTAGE
High and Fluffy	The movement of air through the windrow is more important to the curing process than direct sunlight.
Consistent Formation, Not Bunchy	Permits an even flow of material into the baler, chopper etc.
Even Distribution of Material Across Windrow	Results in even and consistent bales to minimize handling and stacking problems.
Properly Conditioned	Prevents excessive leaf damage.

6.11.5 Driving On Windrow

Driving on previously cut windrows can lengthen drying time by a full day in hay that will not be raked.

If practical, set forming shields for a narrower windrow that can be straddled.

NOTE

Driving on the windrow in high yielding crops may be unavoidable if a full width windrow is necessary.

6.11.6 Raking and Tedding

a. Raking or tedding speeds up drying, however the benefits must be weighed against the additional leaf losses which will result. There is little or no advantage to raking or tedding if the ground beneath the windrow is dry.

b. Large windrows on damp or wet ground should be turned over when they reach 40 - 50% moisture. Hay should not be raked or tedded at less than 25% moisture, or excessive yield losses will result.

6.11.7 Chemical Drying Agents

a. Hay drying agents work by removing wax from legume surfaces, enabling water to escape and evaporate faster. However, treated hay lying on wet ground will also absorb ground moisture faster. Before deciding to use a drying agent, costs and benefits relative to your area should be carefully compared.

6.12 UNPLUGGING THE HEADER

DANGER

Stop windrower engine, and remove key before removing plugged material from header. A child or even a pet could engage the drive.

a. Stop forward movement of the windrower, and disengage the header.

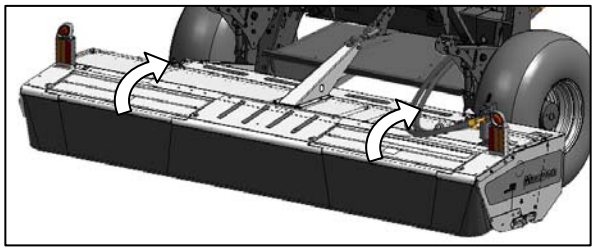
b. Run the header backwards with the header reverse controls in the windrower cab to clear the plug. If plug does not clear, proceed to step c.

c. Raise header fully, shut off engine, remove key.

d. Engage header lift cylinder locks.

WARNING

Wear heavy gloves when working around cutterbar.



e. Open cutterbar doors, and clean off cutterbar by hand.

6.13 STORAGE

Do the following at the end of each operating season:

a. Clean the windrower thoroughly.

CAUTION

Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

b. Store in a dry, protected place if possible. If stored outside, always cover windrower with a waterproof canvas or other protective material.

c. Raise header, and engage header lift cylinder lock-outs.

d. If possible, block up the windrower to take weight off tires.

e. Repaint all worn or chipped painted surfaces to prevent rust.

f. Loosen drive belts.

g. Lubricate the header thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads, cylinder rods, and sliding surfaces of components. Oil cutterbar components to prevent rust.

h. Check for worn components, and repair as necessary.

i. Check for broken components and order replacements from your MacDon Dealer. Attention to these items right away will save time and effort at beginning of next season.

j. Replace or tighten any missing or loose hardware. Refer to Section 7.3.1 Recommended Torques.

k. Remove tall crop dividers (if equipped) to reduce space required for inside storage.

7 MAINTENANCE AND SERVICING

The following instructions are provided to assist the Operator in the use of the disc header. Detailed maintenance, service, and parts information are contained in the Technical Service Manual and Parts Catalog that are available from your MacDon Dealer.

Log hours of operation and use the "Maintenance Checklist" provided to keep a record of scheduled maintenance. Refer to Section 7.12 MAINTENANCE SCHEDULE.

7.1 PREPARATION FOR SERVICING

CAUTION

To avoid personal injury, before servicing header or opening drive covers, perform the following:

- **Fully lower the header. If necessary to service in the raised position, always engage header lift cylinder stops.**
- **Stop engine, and remove key.**
- **Engage park brake.**
- **Wait for all moving parts to stop.**

7.2 RECOMMENDED SAFETY PROCEDURES

- **Park on level surface when possible.**
- **Block wheels securely if windrower is parked on an incline. Follow all recommendations in your Windrower Operator's Manual.**
- **Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.**
- **Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles and heavy gloves.**

- **If more than one person is servicing the machine at the same time, be aware that rotating a driveline or any other mechanically driven component by hand (for example, accessing a lube fitting) will cause drive components in other areas (belts, pulleys, and disc) to move. Stay clear of driven components at all times.**

- **Be prepared if an accident should occur. Know where the first aid kit and fire extinguishers are located and how to use them.**

- **Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.**
- **Use adequate light for the job at hand.**
- **Replace all shields removed or opened for service.**
- **Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design or safety requirements.**
- **Keep the machine clean. Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.**

7.3 MAINTENANCE SPECIFICATIONS

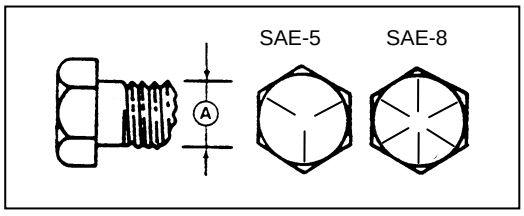
7.3.1 Recommended Torques

- Tighten all bolts to the torques specified in chart unless otherwise noted throughout this manual.
- Check tightness of bolts periodically, using bolt torque chart as a guide.
- Replace hardware with the same strength bolt.
- Torque figures are valid for non-greased or non-oiled threads and heads unless otherwise specified. Do not grease or oil bolts or capscrews unless specified in this manual.
- When using locking elements, increase torque values by 5%.

7.3.1.1 SAE Bolts

BOLT DIA. "A"	NC BOLT TORQUE*			
	SAE-5		SAE-8	
in.	lbf·ft	N·m	lbf·ft	N·m
1/4	9	12	11	15
5/16	18	24	25	34
3/8	32	43	41	56
7/16	50	68	70	95
1/2	75	102	105	142
9/16	110	149	149	202
5/8	150	203	200	271
3/4	265	359	365	495
7/8	420	569	600	813
1	640	867	890	1205

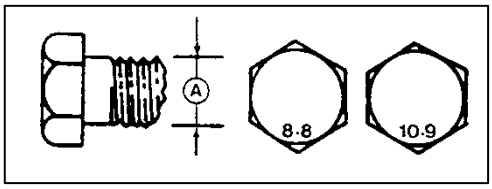
* Torque categories for bolts and capscrews are identified by their head markings.



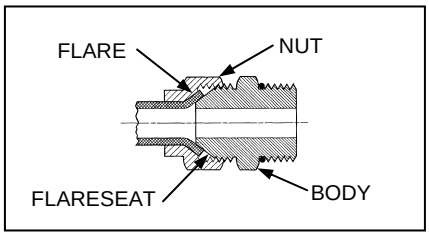
7.3.1.2 Metric Bolts

BOLT DIA. "A"	COARSE BOLT TORQUE*			
	8.8		10.9	
	lbf·ft	N·m	lbf·ft	N·m
M3	0.4	0.5	1.3	1.8
M4	2.2	3	3.3	4.5
M5	4	6	7	9
M6	7	10	11	15
M8	18	25	26	35
M10	37	50	52	70
M12	66	90	92	125
M14	103	140	148	200
M16	166	225	229	310
M20	321	435	450	610
M24	553	750	774	1050
M30	1103	1495	1550	2100
M36	1917	2600	2710	3675

* Torque categories for bolts and capscrews are identified by their head markings.



7.3.1.3 Flare Type Hydraulic Fittings



a. Check flare and flare seat for defects that might cause leakage.

b. Align tube with fitting before tightening.

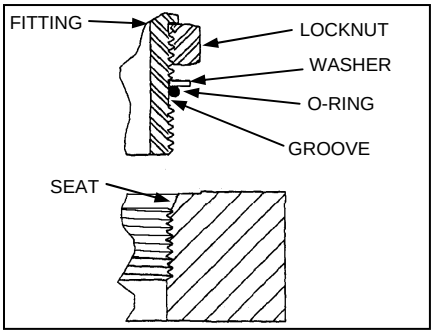
c. Lubricate connection, and hand-tighten swivel nut until snug.

d. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body, and with the second, tighten the swivel nut to the torque shown.

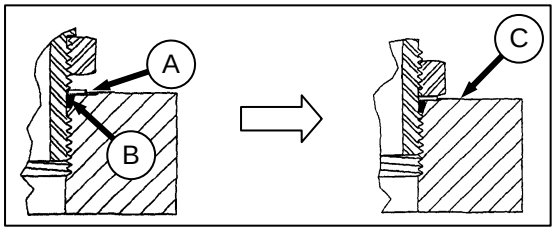
SAE NO.	TUBE SIZE O.D. (in.)	THD SIZE (in.)	NUT SIZE ACROSS FLATS (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)	
				ft·lbf	N·m	Flats	Turns
3	3/16	3/8	7/16	6	8	1	1/6
4	1/4	7/16	9/16	9	12	1	1/6
5	5/16	1/2	5/8	12	16	1	1/6
6	3/8	9/16	11/16	18	24	1	1/6
8	1/2	3/4	7/8	34	46	1	1/6
10	5/8	7/8	1	46	62	1	1/6
12	3/4	1-1/16	1-1/4	75	102	3/4	1/8
14	7/8	1-3/16	1-3/8	90	122	3/4	1/8
16	1	1-5/16	1-1/2	105	142	¾	1/8

* The torque values shown are based on lubricated connections as in re-assembly.

7.3.1.4 O-Ring Boss (ORB) Fittings



a. Inspect O-ring and seat for dirt or obvious defects.



b. On angle fittings, “back off” the lock nut until washer (A) “bottoms out” at top of groove (B) in fitting.

c. Hand-tighten fitting until back up washer (A) or washer face (if a straight fitting) bottoms on part face (C), and O-ring is seated.

d. Position angle fittings by unscrewing no more than one turn.

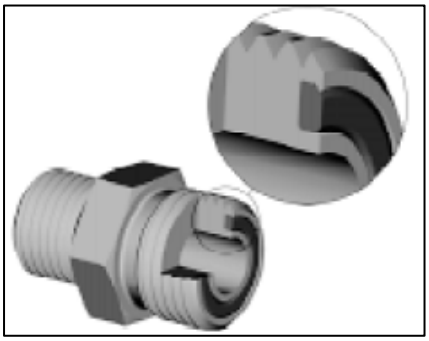
e. Tighten straight fittings to torque shown.

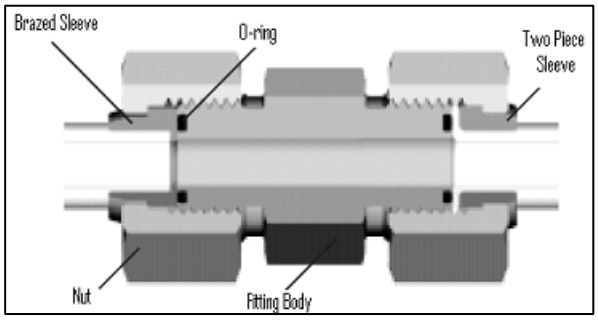
f. Tighten angle fittings to torque shown in the following table, while holding body of fitting with a wrench.

SAE NO.	THD SIZE (in.)	NUT SIZE ACROSS FLATS (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)	
			ft·lbf	N·m	Flats	Turns
3	3/8	1/2	6	8	2	1/3
4	7/16	9/16	9	12	2	1/3
5	1/2	5/8	12	16	2	1/3
6	9/16	11/16	18	24	2	1/3
8	3/4	7/8	34	46	2	1/3
10	7/8	1	46	62	1-1/2	1/4
12	1-1/16	1-1/4	75	102	1	1/6
14	1-3/16	1-3/8	90	122	1	1/6
16	1-5/16	1-1/2	105	142	3/4	1/8
20	1-5/8	1-7/8	140	190	3/4	1/8
24	1-7/8	2-1/8	160	217	1/2	1/12

* The torque values shown are based on lubricated connections as in re-assembly.

7.3.1.5 O-Ring Face Seal (ORFS) Hydraulic Fittings





a. Check components to ensure that the sealing surfaces and fitting threads are free of burrs, nicks, and scratches, or any foreign material.

b. Apply lubricant (typically Petroleum Jelly) to O-ring and threads. If O-ring is not already installed, install O-ring.

c. Align the tube or hose assembly. Ensure that flat face of the mating flange comes in full contact with O-ring.

d. Thread tube or hose nut until hand-tight. The nut should turn freely until it is bottomed out. Torque the fitting further to the specified number of F.F.F.T ("Flats From Finger Tight"), or to a given torque value in the table shown in the opposite column.

NOTE

If available, always hold the hex on the fitting body to prevent unwanted rotation of fitting body and hose when tightening the fitting nut.

e. When assembling unions or two hoses together, three wrenches will be required.

SAE NO.	THD SIZE (in.)	TUBE O.D. (in.)	TORQUE VALUE*		RECOMMENDED TURNS TO TIGHTEN (AFTER FINGER TIGHTENING)**	
			ft·lbf	N·m	Tube Nuts	Swivel & Hose
3	***	3/16	---	---	---	---
4	9/16	1/4	11 - 12	14 - 16	1/4 -1/2	1/2 - 3/4
5	***	5/16	---	---	---	---
6	11/16	3/8	18 - 20	24 - 27	1/4 -1/2	1/2 - 3/4
8	13/16	1/2	32 - 35	43 - 47		
10	1	5/8	45 - 51	60 - 68		
12	1-3/16	3/4	67 - 71	90 - 95		1/3 -1/2
14	1-3/16	7/8	67 - 71	90 - 95		
16	1-7/16	1	93 - 100	125 - 135		
20	1-11/16	1-1/4	126 - 141	170 - 190		
24	2	1-1/2	148 - 167	200 - 225		
32	2-1/2	2	---	---	---	---

* Torque values and angles shown are based on lubricated connection, as in re-assembly.
** Always default to the torque value for evaluation of adequate torque.
*** O-ring face seal type end not defined for this tube size.

7.3.2 Recommended Lubricants

- Your machine can operate at top efficiency only if clean lubricants are used.
- Use clean containers to handle all lubricants.
- Store in an area protected from dust, moisture, and other contaminants.

IMPORTANT

Do not overfill the cutterbar when adding lubricant. Overheating and failure of cutterbar components may occur if overfilled.

LUBRICANT	SPEC.	DESCRIPTION	USE	CAPACITIES	
				16 FT	19 FT
Grease	SAE Multi-Purpose	High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base	As Required Unless Otherwise Specified.	---	
		High Temperature Extreme Pressure (EP) Performance With 10% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base	Driveline Slip-Joints	---	
Gear Lubricant	Traxon LS 80W90*	High Thermal and Oxidation Stability. API Service Class GL-5	Cutterbar	4.4 quarts US (4.25 liters)	2.1 quarts US (2.0 liters)**
	Traxon E Synthetic 75W90		Conditioner Gearbox	17 oz. (500 ml)	
			Bevel Gearbox	13.6 oz. (400 ml)	1 quart (1.41 liters)

* or equivalent

** 19 FT has split cutterbar. Capacity shown is for each cutterbar.

.

7.3.3 Conversion Chart

QUANTITY	INCH-POUND UNITS		FACTOR	SI UNITS (METRIC)	
	UNIT NAME	ABBR.		UNIT NAME	ABBR.
Area	acres	acres	x 0.4047 =	hectares	ha
Flow	gallons per minute (US) gallons per minute (Imp)	gpm (US) gpm	x 3.7854 = x 4.5460 =	liters per minute	L/min
Force	pounds force	lbf	x 4.4482 =	Newtons	N
Length	inch	in.	x 25.4 =	millimeters	mm
	foot	ft	x 0.305 =	meters	m
Power	horsepower	hp	x 0.7457 =	kilowatts	kW
Pressure	pounds per square inch	psi	x 6.8948 =	kilopascals	kPa
			x .00689 =	megapascals	MPa
Torque	pound feet or foot pounds	lbf·ft or ft·lbf	x 1.3558 =	newton meters	N·m
	pound inches or inch pounds	lbf·in. or in·lbf	x 0.1129 =		
Temperature	degrees Fahrenheit	˚F	(˚F - 32) x 0.56 =	Celsius	˚C
Velocity	feet per minute	ft/min	x 0.3048 =	meters per minute	m/min
	feet per second	ft/s	x 0.3048 =	meters per second	m/s
	miles per hour	mph	x 1.6063 =	kilometers per hour	km/h
Volume	ounces	oz.	x 29.5735 =	milliliters	ml
	cubic inches	$in.^3$	x 16.3871 =	cubic centimeters	cm^3 or cc
	quarts (US) quarts (Imperial)	US qt. qt.	x 0.96464 x 1.1365	liters	L
	gallons (US) gallons (Imperial)	US gal. gal.	x 3.7854 = x 4.5460 =		
Weight	pounds	lb	x 0.4536 =	kilograms	kg

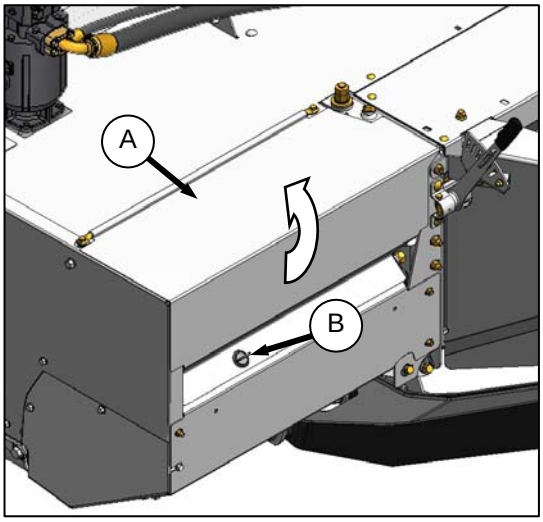
7.4 HEADER LIFT CYLINDER LOCKS

Refer to your MacDon Self-Propelled Windrower Operator's Manual for details on the header lift cylinder locks.

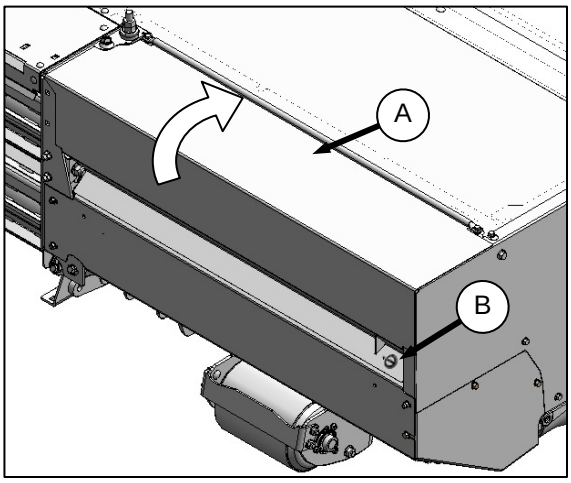
7.5 DRIVESHIELDS

WARNING

Do not operate the machine with the driveshields open. High speed rotating components may throw debris and could result in death or serious injury.



16 FT HEADER - LEFT END



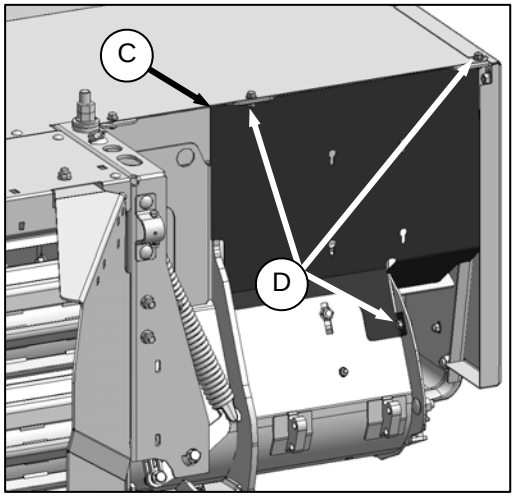
19 FT HEADER - RIGHT END

a. To open the driveshield (A), rotate fastener (B) ¼ turn, and lift shield to "open" position.

NOTE

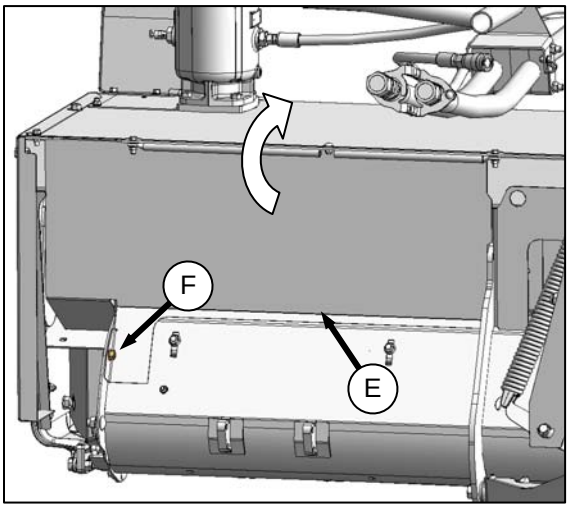
Fastener is spring-loaded, and should return to original position.

b. To close, lower shield, and fastener will self-latch.



16 FT HEADER - RIGHT END

c. To remove the right end cover (C) on the 16 FT header, remove three bolts (D), and remove cover.



19 FT HEADER - LEFT END

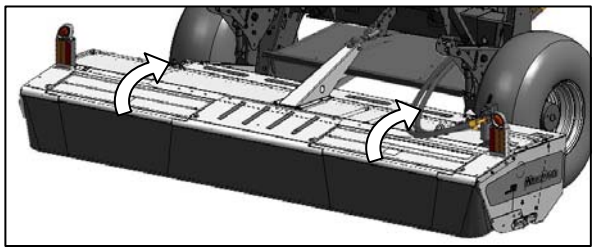
d. To open the driveshield (E) on the 19 FT header, remove bolt (F), and lift shield.

e. To close, lower shield (E), and install bolt (F).

7.6 CUTTERBAR DOORS

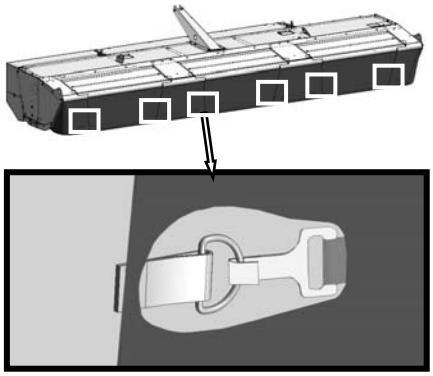
WARNING

Do not operate the machine without all the cutterbar doors down, curtains installed and in good condition.



There are two doors to provide access to the 16 FT cutterbar area, and three doors on the 19 FT header.

Rubber curtains are attached to each door, and at the front corners and center fixed cover.



Latches at the lower corners of each curtain keep the curtains together, and minimize the risk of thrown objects.

The cutterbar curtains are very important to reduce the potential for thrown objects. Always keep these curtains down and latched when operating the mower conditioner.

Replace the curtains if they should become worn or damaged. Refer to your MacDon Dealer or the Technical Service Manual for replacement instructions.

a. To open door, unhook latches, and lift at front of door.

b. To close door, pull at top, and move to “closed” position. Hook latches.

CAUTION

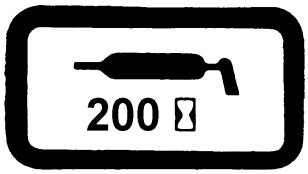
To avoid injury, keep hands and finger away from corners of doors when closing.

7.7 LUBRICATION

WARNING

To avoid personal injury, before servicing windrower or opening drive covers, follow procedures in Section 7.1 PREPARATION FOR SERVICING.

The greasing points are marked on the machine by decals showing a grease gun and grease interval in hours of operation.



Log hours of operation and use the "Maintenance Checklist" provided to keep a record of scheduled maintenance. Refer to Section 7.12 MAINTENANCE SCHEDULE.

7.7.1 Greasing Procedure

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Use the recommended lubricants specified in this manual. See Section 7.3.2 Recommended Lubricants.
b. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
c. Inject grease through fitting with grease gun until grease overflows fitting, except where noted.
d. Leave excess grease on fitting to keep out dirt.
e. Replace any loose or broken fittings immediately.
f. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

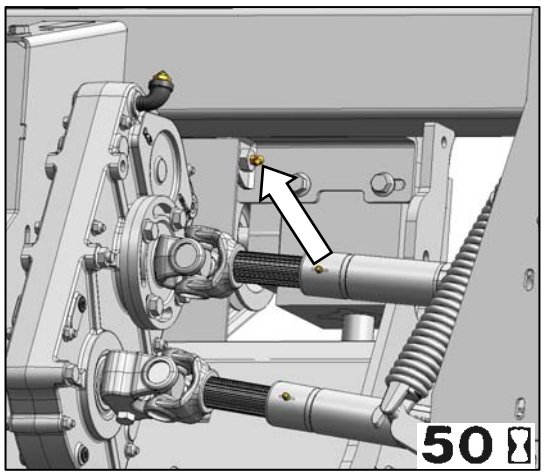
7.7.2 Greasing Points

Refer to the illustrations on the following pages to identify the various locations that require lubrication.

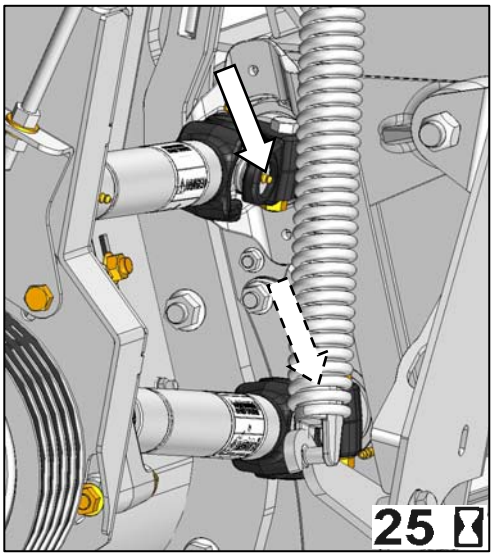
Greasing Points (cont'd)

16 FT HEADER SHOWN - 19 FT OPPOSITE EXCEPT AS NOTED

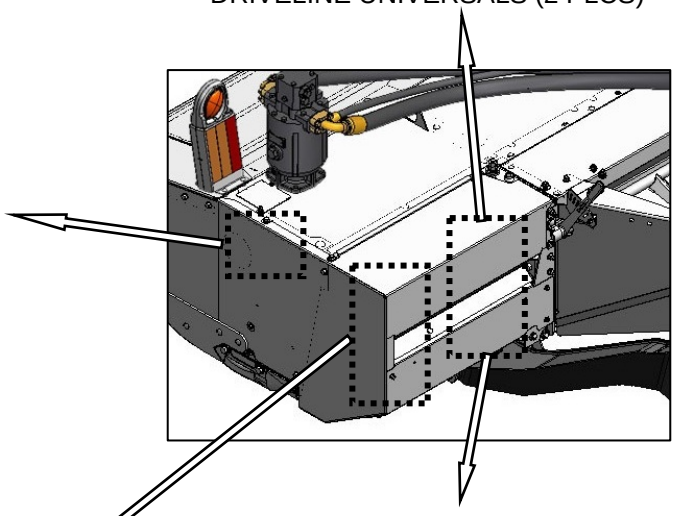
High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base

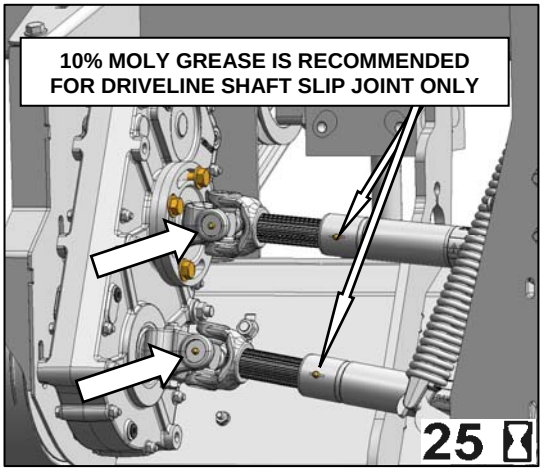


BELT TENSIONER PIVOT (1 PLC)

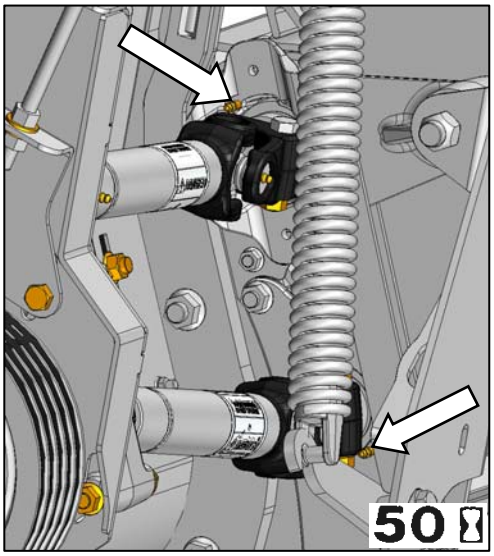


DRIVELINE UNIVERSALS (2 PLCS)





DRIVELINE UNIVERSALS (2 PLCS)
DRIVELINE SHAFT (2 PLCS)

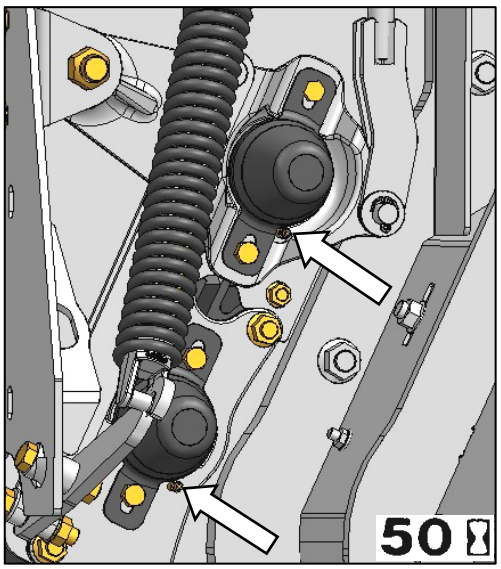


ROLL SHAFT BEARINGS (2 PLCS)

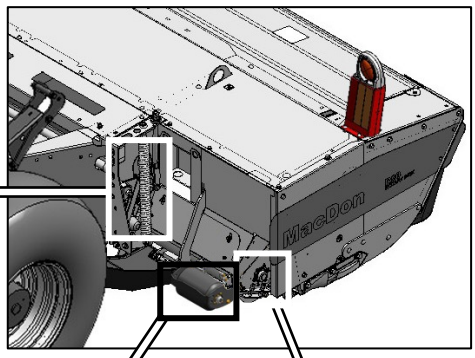
Greasing Points (cont'd)

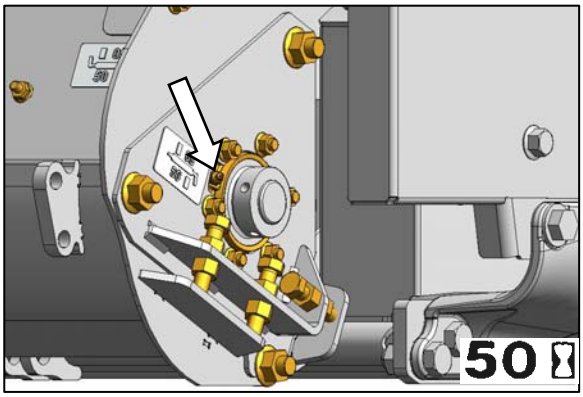
16 FT HEADER SHOWN - 19 FT OPPOSITE EXCEPT AS NOTED

High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base

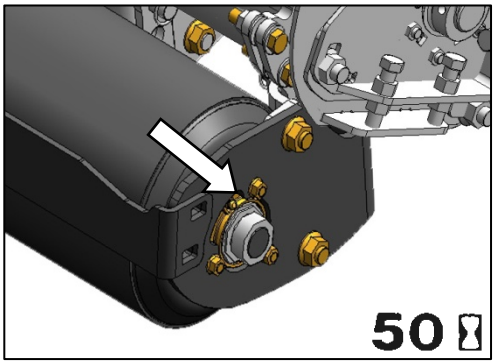


ROLL SHAFT BEARINGS (2 PLCS)

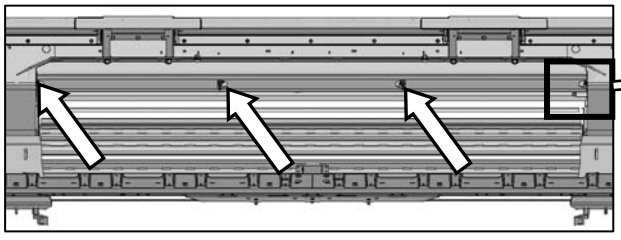




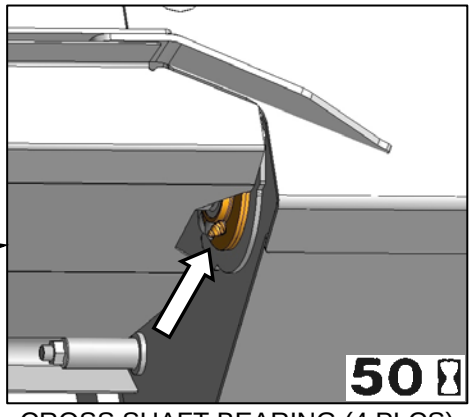
AUGER BEARING (1 PLC)



OPTIONAL GAUGE ROLL BEARINGS (2 PLCS) BOTH SIDES



19 FT ONLY

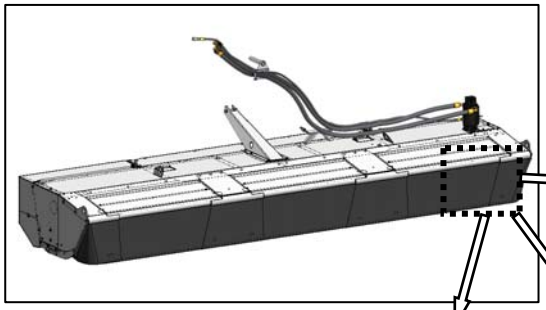


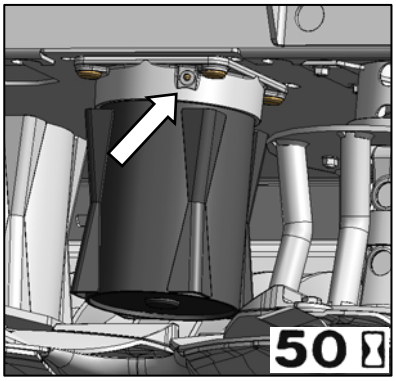
CROSS SHAFT BEARING (4 PLCS)

Greasing Points (cont'd)

16 FT HEADER SHOWN - 19 FT OPPOSITE EXCEPT AS NOTED

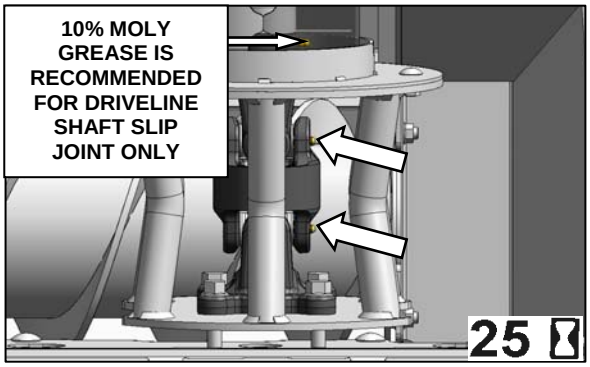
High Temperature Extreme Pressure (EP2) Performance With 1% Max Molybdenum Disulphide (NLGI Grade 2) Lithium Base





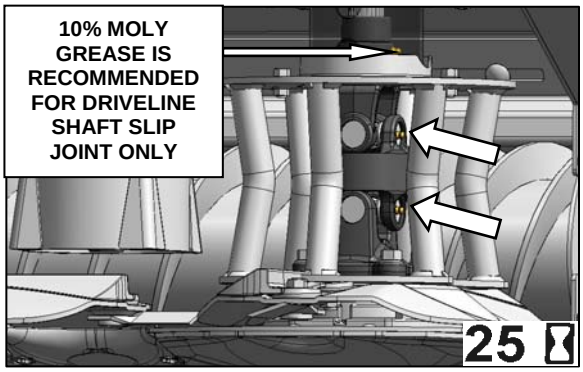
19 FOOT - SUSPENDED DEFLECTOR (1 PLC) BOTH SIDES

10% MOLY GREASE IS RECOMMENDED FOR DRIVELINE SHAFT SLIP JOINT ONLY

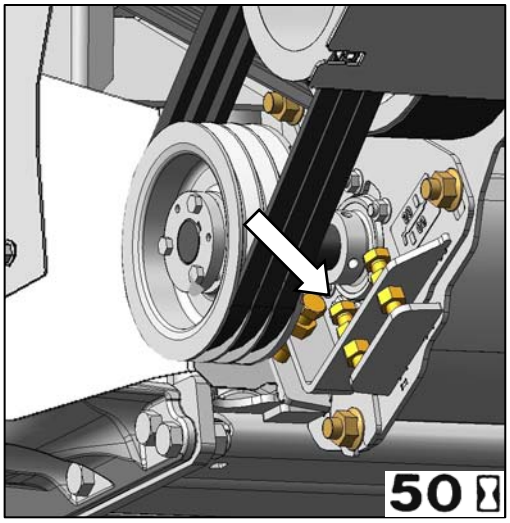


16 FOOT - DRIVELINE UNIVERSALS (2 PLCS) DRIVESHAFT (1 PLC)

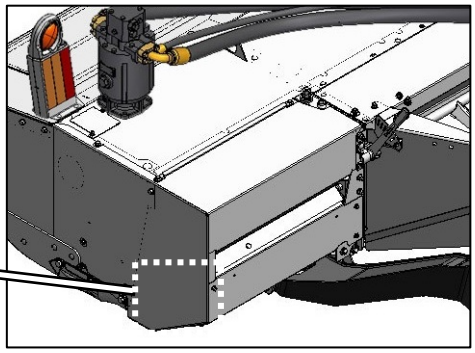
10% MOLY GREASE IS RECOMMENDED FOR DRIVELINE SHAFT SLIP JOINT ONLY



19 FOOT - DRIVELINE UNIVERSALS (2 PLCS) DRIVESHAFT (1 PLC) - BOTH SIDES

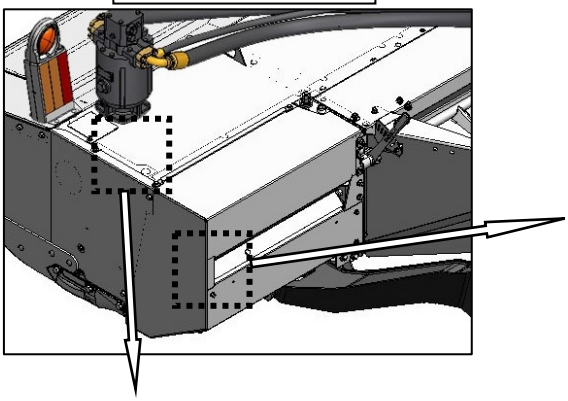


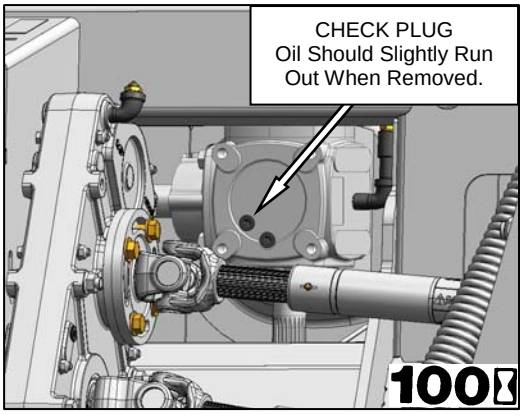
AUGER BEARING (1 PLC)



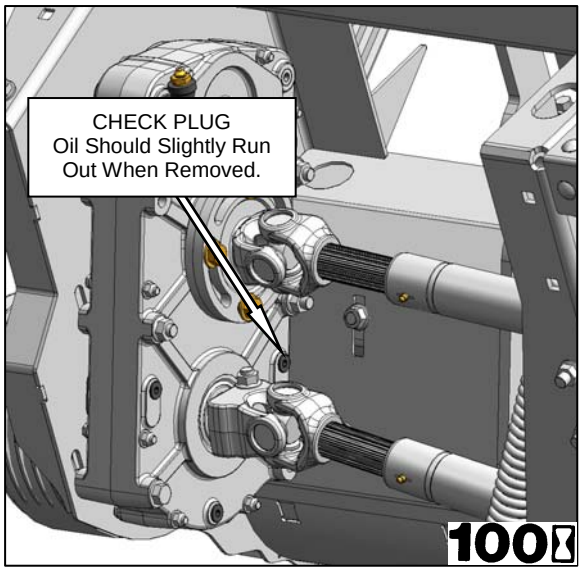
7.7.3 Lubricant Levels

16 FT HEADER



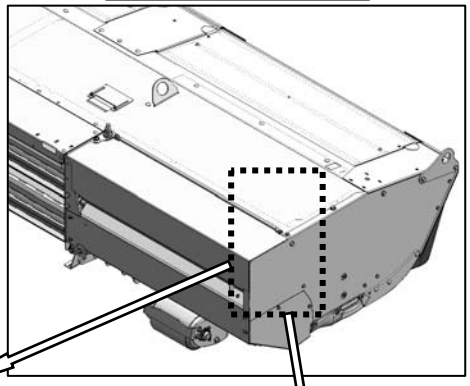


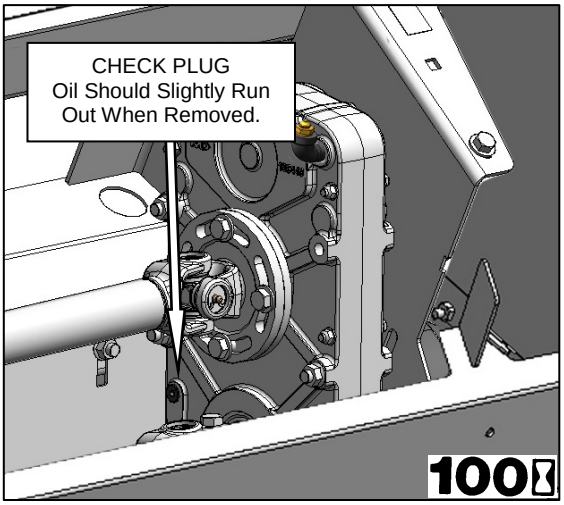
GEARBOX OIL LEVEL
(CHECK WITH TOP OF HEADER HORIZONTAL)



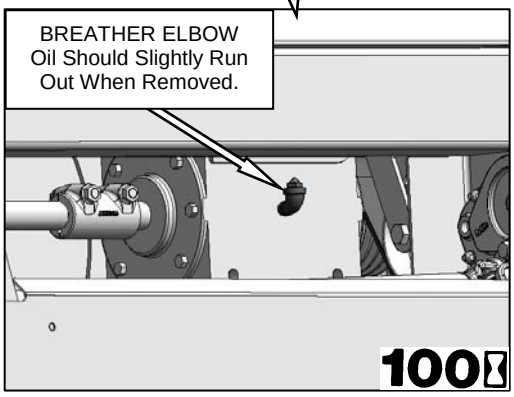
GEARBOX OIL LEVEL
(CHECK WITH HEADER FULLY RAISED)

19 FT HEADER





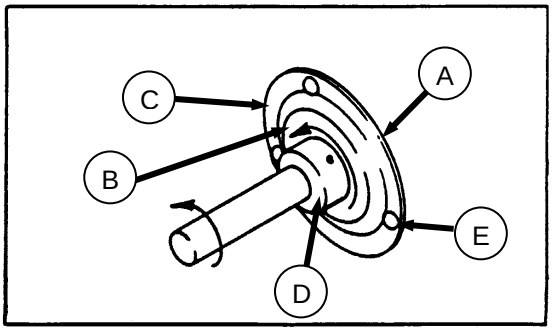
GEARBOX OIL LEVEL
(CHECK WITH HEADER FULLY RAISED)



GEARBOX OIL LEVEL - BOTH SIDES
(CHECK WITH TOP OF HEADER HORIZONTAL)

7.7.4 Sealed Bearing Installation

a. Clean shaft, and coat with rust preventative.



b. Install flangette (A), bearing (B), second flangette (C), and lock collar (D).

NOTE

The locking cam is only on one side of the bearing.

c. Install (but do not tighten) the flangette bolts (E).

d. When the shaft is correctly located, lock the lock collar with a punch.

NOTE

The collar should be locked in the same direction the shaft rotates. Tighten the set screw in the collar.

e. Tighten the flangette bolts.

f. Loosen the flangette bolts on the mating bearing one turn, and re-tighten. This will allow the bearing to “line up”.

7.8 CUTTERBAR

7.8.1 Cutter Bar Lubrication

The lubricant level in the cutterbar **cannot** be checked. If in doubt as to the quantity of lubricant in the cutterbar, do not add lubricant. Drain the cutterbar, and refill with new clean lubricant as follows:

IMPORTANT

Drain the cutterbar when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

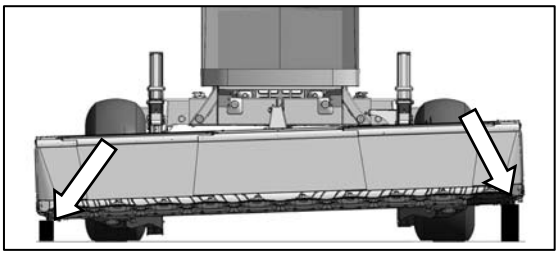
7.8.1.1 Draining

a. Park the machine on level ground, raise header fully, stop engine, and remove key.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage header lift cylinder stops before going under machine for any reason.

b. Engage header lift cylinder locks.

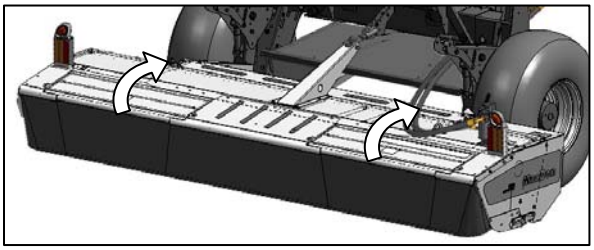


c. Place blocks of different heights under each end of the header.

NOTE

The block under the left end of the header should be higher than the right end.

d. Disengage the header lift cylinder locks, start windrower, and lower header onto blocks. Shutdown windrower and remove key.

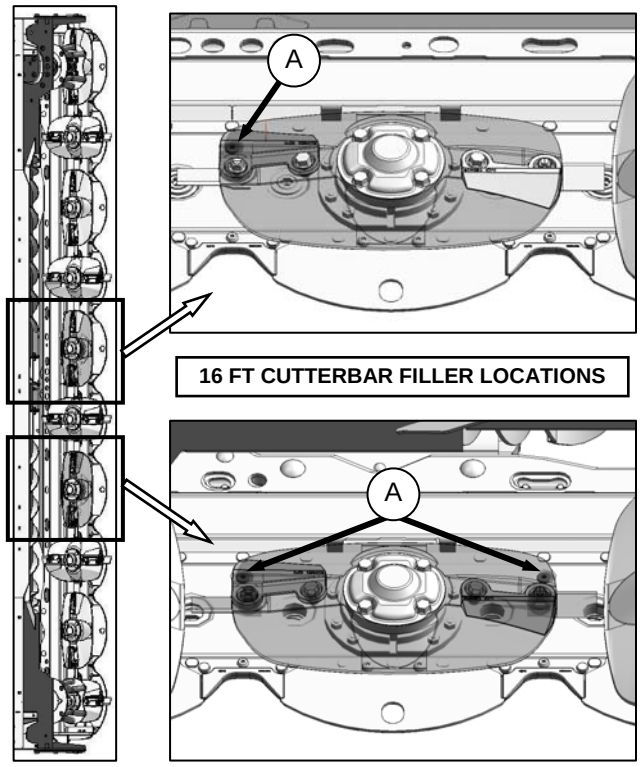


e. Open cutterbar doors.

f. Locate one of the filler plugs along the top of the cutterbar. The 16 FT header has three plugs, and the 19 FT header has four (two per side). Refer to illustration for exact locations of plugs.

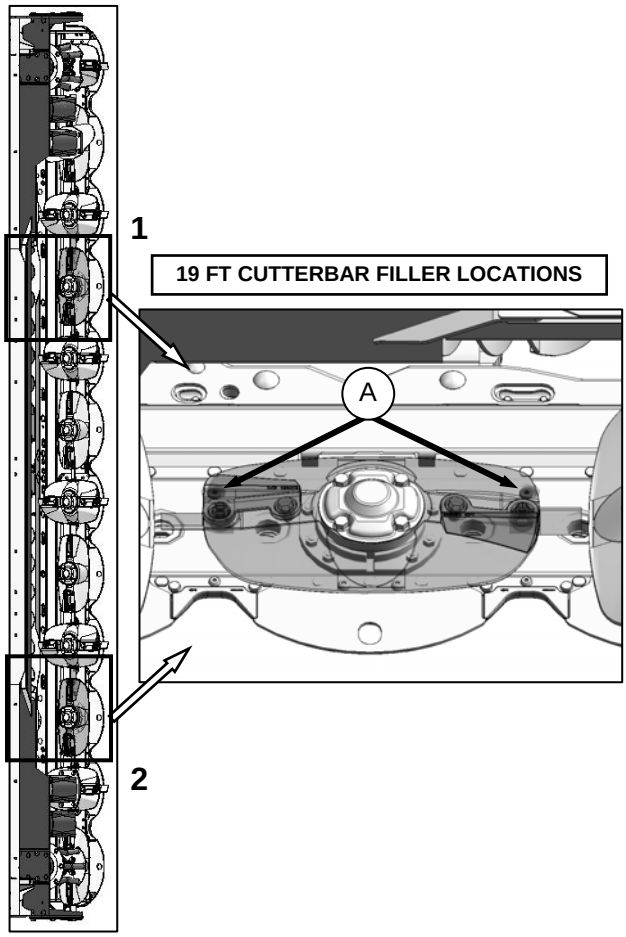
NOTE

Rotate disc to expose filler if necessary.



16 FT CUTTERBAR FILLER LOCATIONS

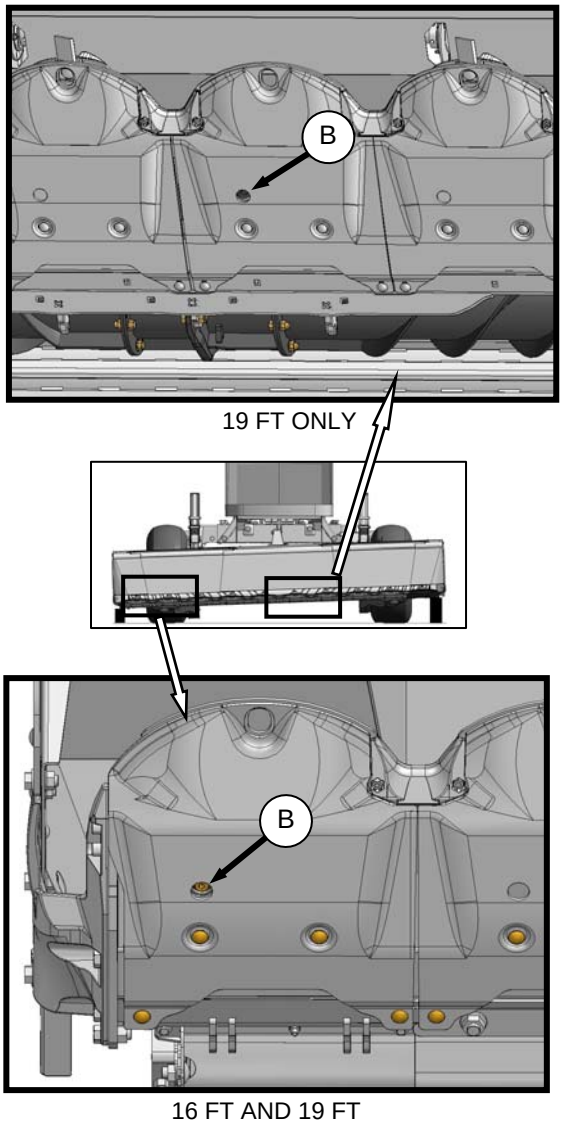
(continued next page)



g. Clean around either filler (A), and remove plug with an 8 mm hex L-Key. For 19 FT cutterbar, remove one plug from both Locations **1** and **2**.

NOTE

19 FT header has two cutterbars.



h. Place a suitably sized container under the cutterbar drain hole (B). Two containers required for 19 FT cutterbar.

i. Remove plug(s) (B) with an 8 mm hex L-Key, and allow sufficient time for lubricant to drain.

IMPORTANT

Do not flush the cutterbar.

j. Replace drain plug(s) (B), and tighten.

k. Safely dispose of lubricant.

7.8.1.2 Filling

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key, and engage header lift cylinder stops before going under machine for any reason.

CAUTION

Never start or move the machine until you are sure all bystanders have cleared the area.

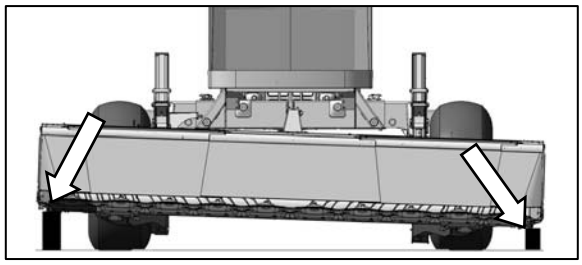
a. Start engine, and raise header. Stop engine, and engage header lift cylinder lock-outs.

b. Move higher block to RIGHT end of header, and remove used lubricant container.

NOTE

Having the fill end higher allows for quicker filling of cutterbar.

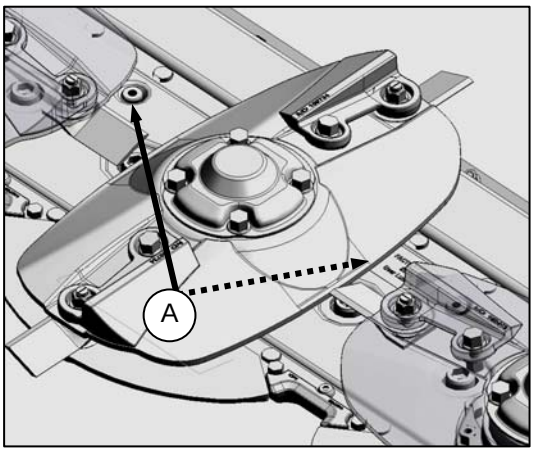
c. Disengage header lift cylinder lock-outs.



d. Start engine, and lower header onto blocks. Stop engine, and remove key.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.



e. Add Traxon SAE 80W90 lubricant through filler hole (A) as follows:

- 16 FT - 4.4 quarts US (4.25 liters)
- 19 FT - 2.1 quarts US (2.0 liters) per cutterbar

NOTE

See illustrations in previous section for locations of filler holes.

IMPORTANT

Do not overfill the cutterbar. Overfilling can cause overheating, and damage to or failure of cutterbar will occur.

f. Replace the previously removed filler plug(s) (A).

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

g. Close cutterbar doors.

h. Start engine, and raise header.

i. Stop engine, and engage header lift cylinder lock-outs.

j. Remove blocks.

7.8.2 Rock Guards

The R85 is equipped with a rock guard at each cutting disc location.

The rock guard prevents the cutterbar from digging into the ground, and protects the disc from coming in contact with stones and other debris.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

DANGER

To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage header lift cylinder stops before going under machine for any reason.

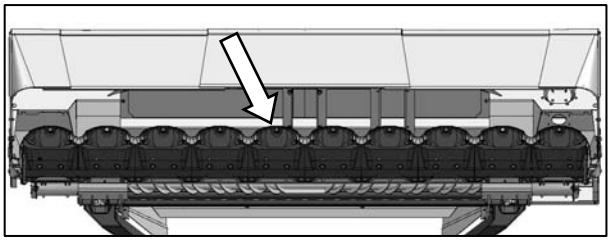
CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

Check rock guard periodically for severe damage or wear as follows:

a. Raise header fully, stop engine, and remove key.

b. Engage header lift cylinder locks.



c. Inspect rock guards for severe damage, wear, and distortion. The guards should be replaced if severely damaged or worn.

d. Check for loose or missing fasteners, and tighten or replace fastener if missing.

e. See the Technical Service Manual or your MacDon Dealer for replacement procedures.

7.8.3 Disc Maintenance

Check daily that discs are not damaged by rocks, or worn excessively from abrasive working conditions.

They are interchangeable, and a disc can be moved to a spindle that rotates in the opposite direction, as long as it is in a useable condition.

The discs are <u>not</u> repairable, and must be replaced if severely damaged or worn.

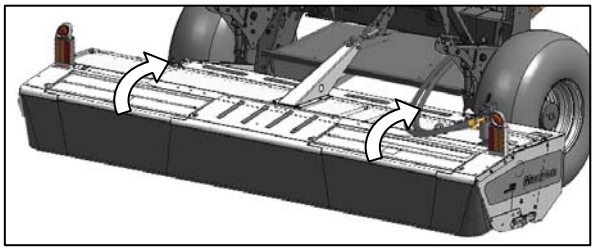
IMPORTANT

If holes appear in a disc, replace the disc immediately. Do <u>not</u> attempt to repair the discs. Always use factory replacement parts.

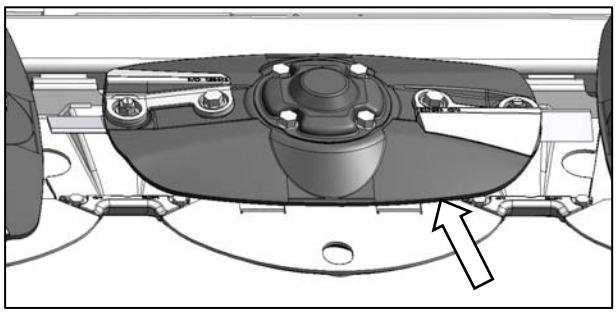
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, shut off engine, and remove key.



b. Open cutterbar doors.



c. Check discs for damage or loose fasteners.

d. Replace damaged discs. Refer to following section (depending on your R85 model).

e. Replace damaged fasteners. Tighten loose fasteners.

f. Close cutterbar doors.

7.8.3.1 Disc Removal/Installation - 16 FT

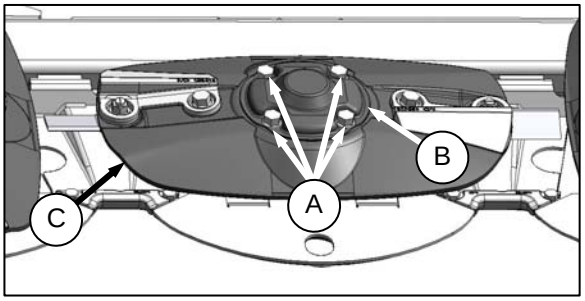
CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

a. Open cutterbar doors.

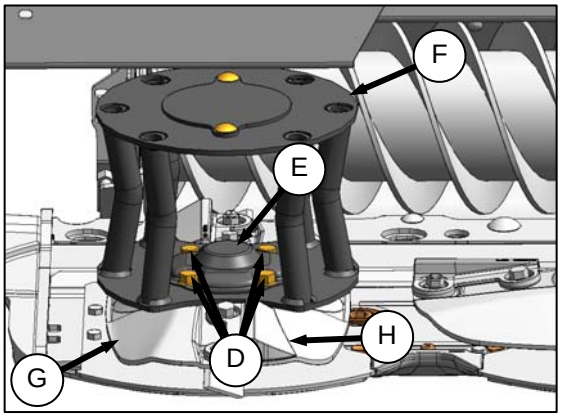
b. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.

c. Replacing a disc:



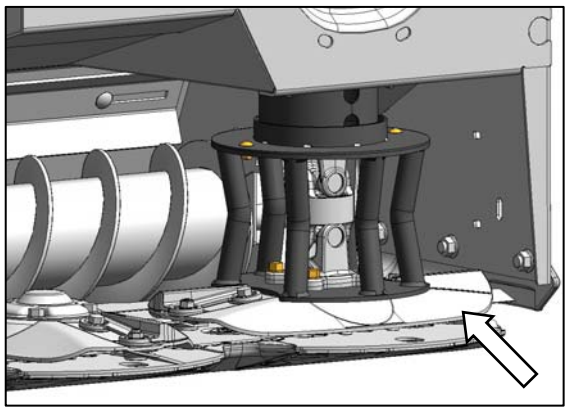
1. Remove four bolts (A) on disc cover (B), and remove cover and disc (C).
2. Position new disc (C) on spindle ensuring it is 90 degrees to the adjacent discs.
3. Install cover (B), and secure with four bolts (A). Tighten bolts to 92 ft·lbf (125 N·m).

d. Replacing disc under driven cage deflector:



1. Remove four bolts (D).
2. Remove cover (E), deflector (F), and disc (G).
3. Position new disc (G) on spindle ensuring it is 90 degrees to adjacent discs.
4. Position deflector (F) on spindle so that it clears accelerators (H).
5. Install cover (E), and secure with four bolts (D). Tighten bolts to 92 ft·lbf (125 N·m).

e. Replacing the driveline disc:



Refer to the Technical Service Manual.

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

f. Remove block of wood (if used).

g. Close doors.

7.8.3.2 Disc Removal/Installation - 19 FT

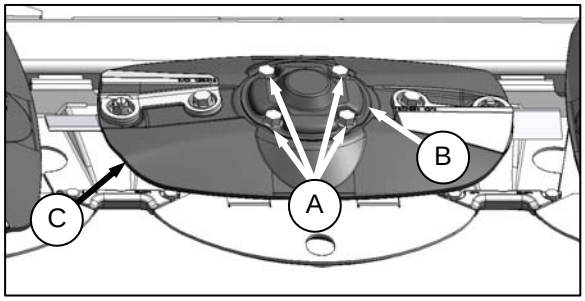
CAUTION

Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

a. Open cutterbar doors.

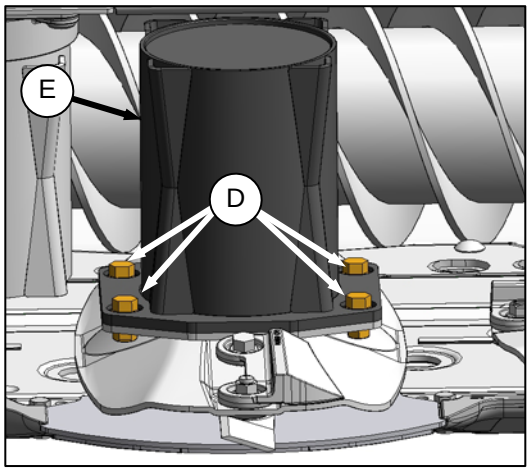
b. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.

c. Replacing a disc:

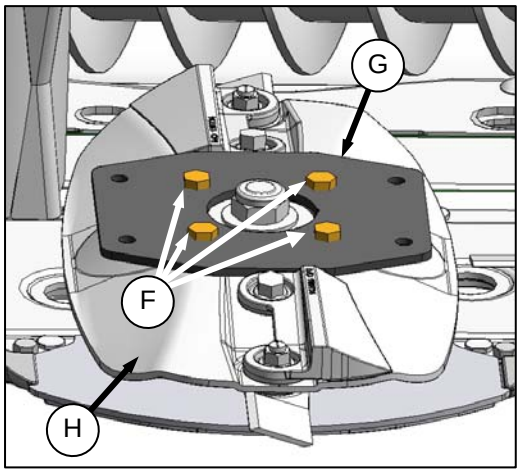


1. Remove four bolts (A) on disc cover (B), and remove cover and disc (C).
2. Position new disc (C) on spindle ensuring it is 90 degrees to the adjacent discs.
3. Install cover (B), and secure with four bolts (A). Tighten bolts to 92 ft·lbf (125 N·m).

d. Replacing disc under driven deflector:



1. Remove four bolts (D), and remove deflector (E).



2. Remove four bolts (F), and remove plate (G) and disc (H).
3. Position new disc on spindle, ensuring it is 90 degrees to adjacent disc.
4. Place plate (G) onto disc, and install four bolts (F). Torque bolts to 92 ft·lbf (125 N·m).
5. Place deflector (E) onto plate (G), and install four bolts and nuts.
6. Torque bolts (D) to 92 ft·lbf (125 N·m).

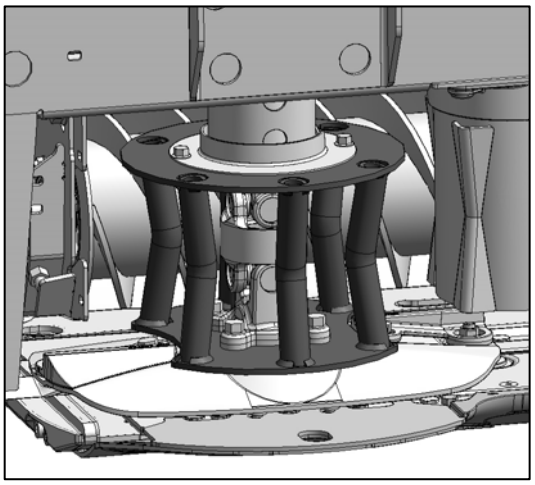
WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

e. Remove block of wood (if used).

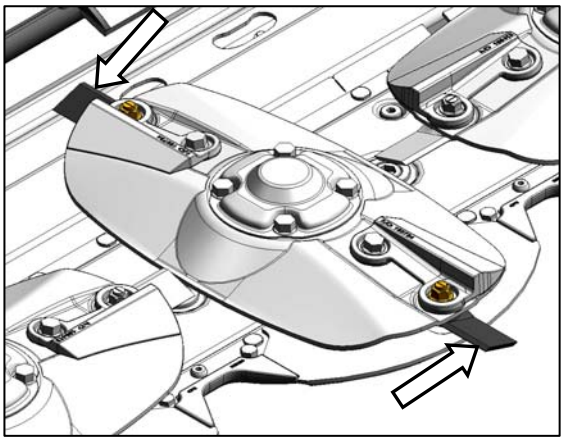
f. Close doors.

g. Replacing driveline disc:



Refer to Technical Service Manual.

7.8.4 Cutter Blades



Each disc has two cutter blades attached to either end. These blades are free to swivel horizontally on a specially designed shoulder bolt.

The blade, with its two cutting edges, can be flipped over so that the blade doesn't need to be replaced as often.

The blades are not repairable, and must be replaced if severely damaged or worn.

IMPORTANT

Always use factory replacement parts.

7.8.4.1 Inspection

CAUTION

Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

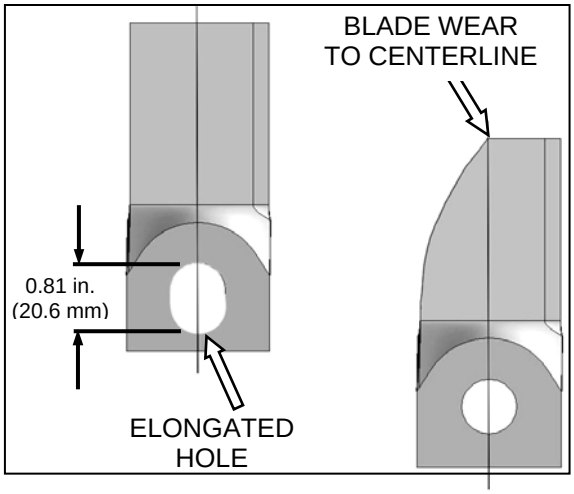
CAUTION

Damaged blades may damage the cutterbar, and result in poor cutting performance. Replace damaged blades at earliest possible opportunity.

DANGER

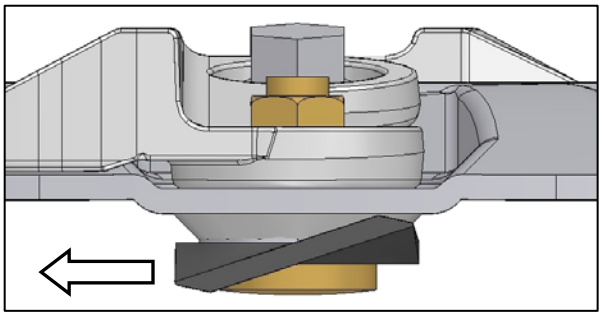
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Check daily that the cutter blades are securely attached to the disc.

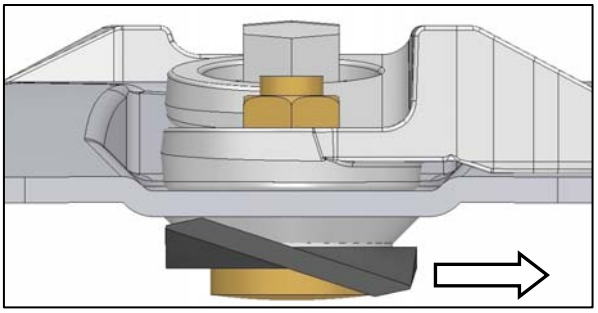


b. Check blades for cracks or wear beyond safe operating limits and distortion.

c. Replace blades immediately if any of these problems occur.



CLOCKWISE DISC



COUNTER CLOCKWISE DISC

IMPORTANT

Blades should be replaced in pairs, otherwise the disc may be unbalanced and damage the cutterbar.

IMPORTANT

The cutter blades have cutting edges on both edges so that the blade can be turned over and reused. The twist in each blade determines if its cutting direction is clockwise or counter clockwise.

7.8.4.2 Replacement

CAUTION

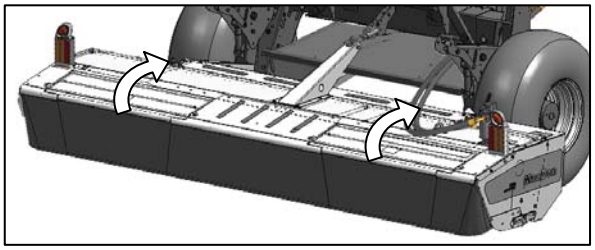
Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

DANGER

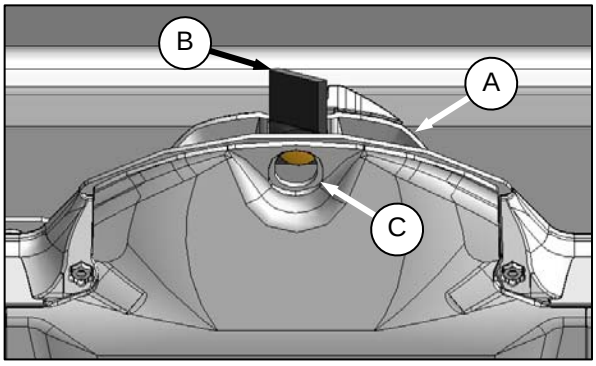
To avoid bodily injury or death from unexpected start-up or fall of raised machine; stop engine, remove key and engage lift cylinder lock-out valves before going under machine for any reason.

a. Raise header fully, shut off engine, and remove key.

b. Engage lift cylinder lock-out valves.



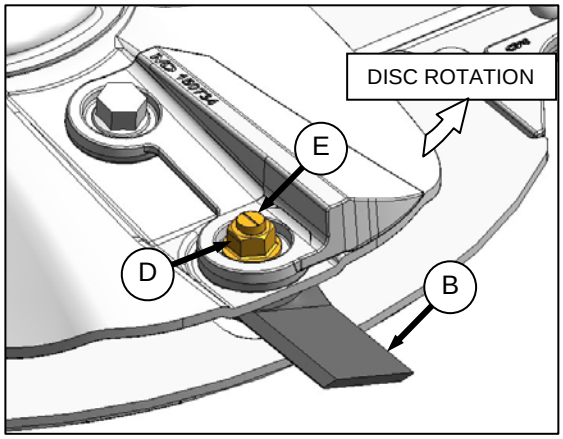
c. Open cutterbar door(s).



d. Rotate disc (A) so that blade (B) faces “forward”, and “lines up” with hole (C) in rock guard.

e. Place a block of wood between two discs to prevent disc rotation while loosening blade bolts.

f. Clean debris from blade attachment area.



g. Remove nut (D).

h. Remove shoulder bolt (E) through hole (C) in rock guard, to remove blade (B).

i. Install new or reversed blade (B) with shoulder bolt (E) onto disc.

IMPORTANT

Ensure blade is installed correctly to suit rotation of disc. Refer to illustrations on previous page.

j. Install nut (D). Tighten nut to 100 ft·lbf (135 N·m).

k. Remove block of wood (if used).

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

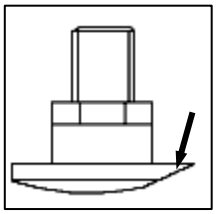
l. Close doors.

7.8.4.3 Cutter Blade Hardware

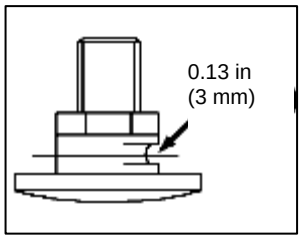
Check blade attachment hardware each time blades are changed. Refer to previous section for hardware replacement procedure.

a. Check bolts for wear or damage, and replace bolt if:

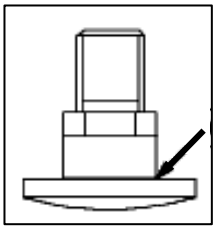
1. Bolt has been removed and installed five times.



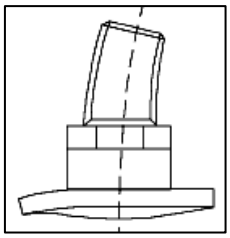
2. Head is worn flush with bearing surface of blade.



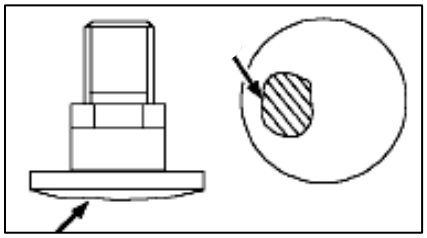
3. Diameter of bolt neck is worn out of specification.



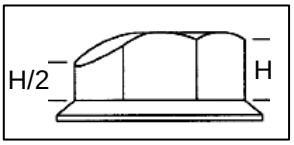
4. Bolt is cracked.



5. Bolt is visibly distorted.



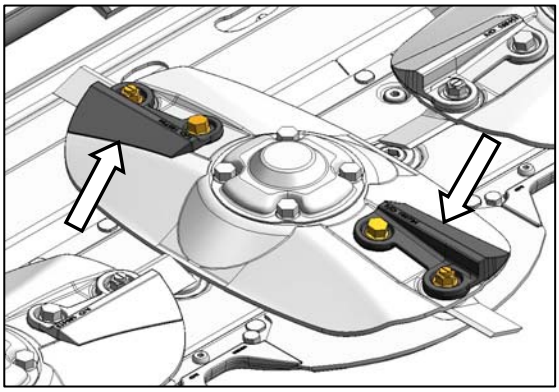
6. Evidence of interference with adjacent parts.



b. Check nuts for wear or damage, and replace nut if:

- Worn height is less than half total height.
- Nut is cracked.
- Nut has been removed and installed five times.

7.8.5 Accelerators



Two accelerators are mounted on each disc, and are designed to quickly move the cut material off the disc and into the auger and conditioner.

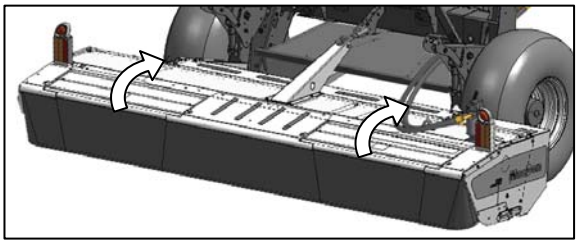
They are replaceable, and should be periodically inspected for damage and loose or missing fasteners.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Raise header fully, stop engine, and remove key.

b. Engage header lift cylinder locks.



c. Open cutterbar doors.

CAUTION

Cutter blades have two cutting edges. Exercise caution when working around the blades. Blades are sharp and can cause serious injury. Wear gloves when handling blades.

d. Inspect accelerators for severe damage and wear. They should be replaced if severely damaged or worn.

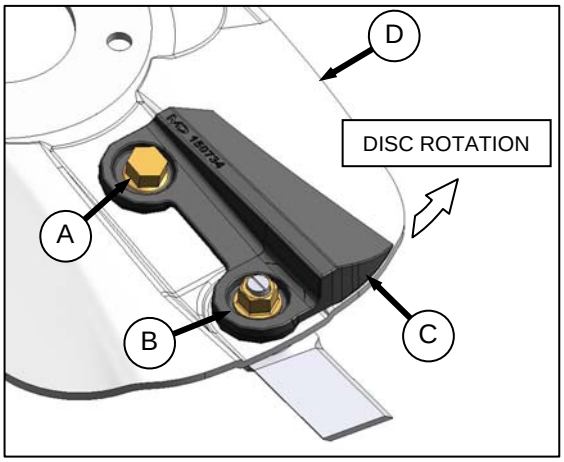
e. Check for loose or missing fasteners, and tighten or replace fastener if missing.

7.8.5.1 Replacing Accelerators

a. Raise header fully, shut off engine, and remove key.

b. Engage lift cylinder lock-out valves.

c. Remove disc. See Section 7.8.3 Disc Maintenance.



d. Remove bolt and nut (A), and nut (B) and remove accelerator (C) from disc (D).

IMPORTANT

Do not remove cutter blade bolt unless it or the blade are being replaced. Repeat for other accelerator.

e. Locate new accelerator on disc onto existing cutter blade bolt. Install nut (B).

NOTE

Accelerators are handed for clockwise or counter clockwise operation. Verify the direction of disc before installing accelerators.

f. Install hex bolt (A) and nut at inboard hole. Bolt head faces “up”.

g. Tighten both nuts to 100 ft·lbf (135 N·m).

h. Repeat for other accelerator.

i. Re-install disc (D) on spindle. Refer to Section 7.8.3. Disc Maintenance.

j. Remove block of wood (if used).

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started, and may result in serious injury or machine damage.

k. Close cutterbar doors.

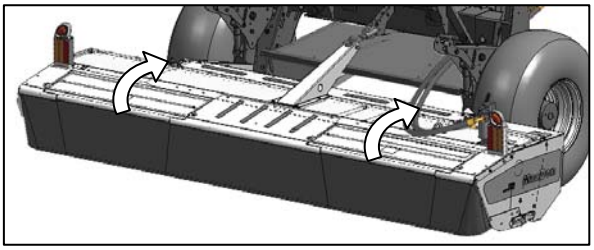
7.8.6 Deflectors

The deflectors are designed to deliver the cut material from the ends of the cutterbar into the auger, and to assist in maintaining an even flow of crop into the conditioner. They should be checked daily for damage and wear.

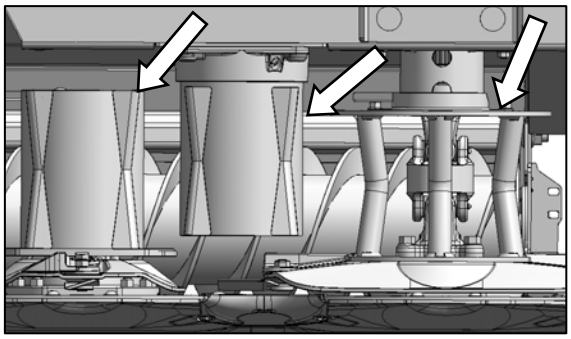
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

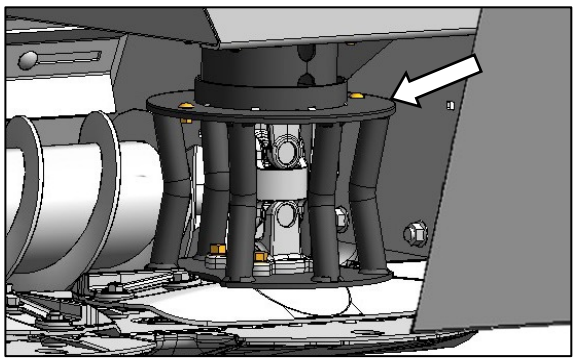
a. Lower header to ground, shut off engine, and remove key.



b. Open cutterbar doors.



19 FT - BOTH SIDES



16 FT - BOTH SIDES

c. Check that deflectors are not damaged or bent by rocks, and for loose fasteners.

d. Replace deflectors if they are severely damaged or worn. See next section for your R85 model. Do not repair.

e. Tighten loose fasteners.

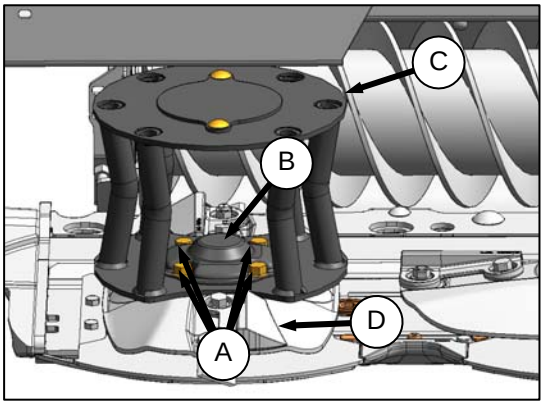
f. Close cutterbar doors.

7.8.6.1 Deflector Removal/Installation - 16 FT

a. Open cutterbar doors.

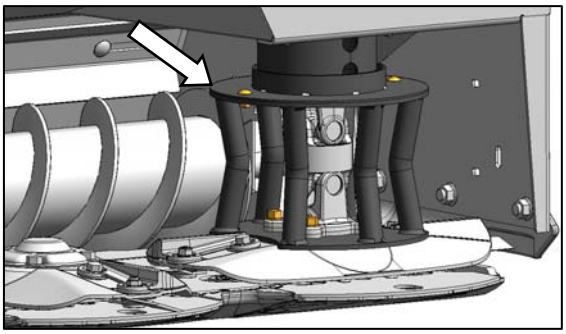
b. Replacing driven deflector:

1. Place a block of wood between two discs to prevent deflector from turning.



2. Remove four bolts (A).
3. Remove cover (B) and deflector (C).
4. Position new deflector (C) on spindle so that it clears accelerators (D).
5. Install cover (B), and secure with four bolts (A).
6. Tighten bolts to 92 ft·lbf (125 N·m).

c. Replacing driveline deflector:



16 FT - BOTH SIDES

Refer to the Technical Service Manual or your MacDon Dealer.

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

d. Close doors.

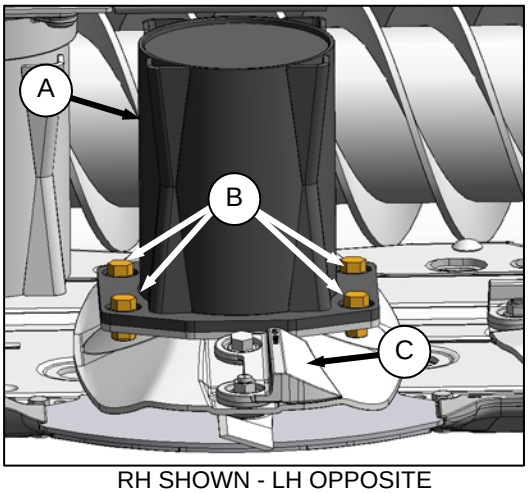
7.8.6.2 Deflector Removal/Installation - 19 FT

WARNING

Ensure cutterbar is completely clear of foreign objects. These objects can be ejected with considerable force when the machine is started and may result in serious injury or machine damage.

a. Replacing Driven Deflectors

1. Open outboard cutterbar doors.

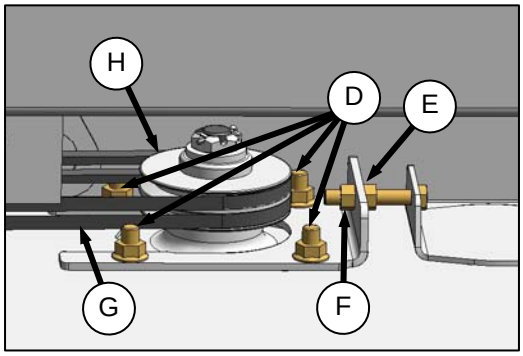


RH SHOWN - LH OPPOSITE

2. Place a block of wood between two discs to prevent deflector (A) from turning.
3. Remove four bolts (B), and remove deflector (A).
4. Position new deflector on spindle so that it clears accelerators (C).
5. Install four bolts (B), and torque to 92 ft·lbf (125 N·m).

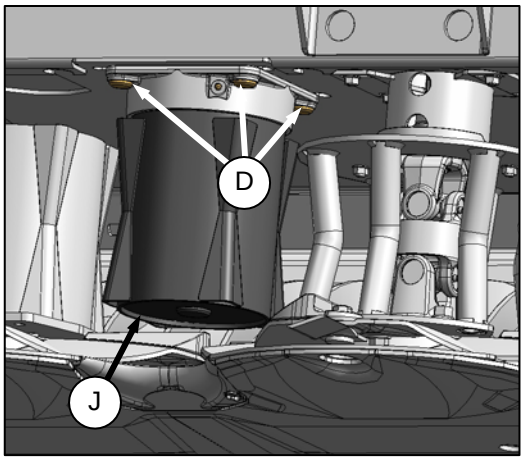
b. Replacing Suspended Deflector

1. Open rear driveshield. See Section 7.5 DRIVESHIELDS.
2. Open outboard cutterbar doors.



LH SHOWN - RH OPPOSITE

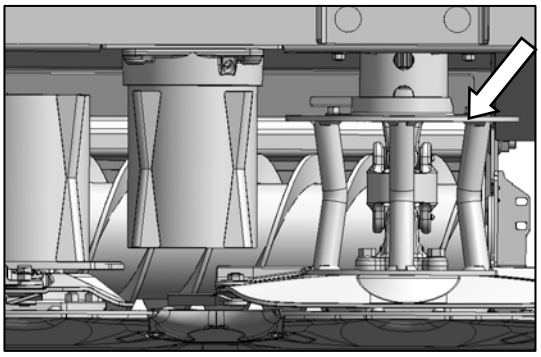
3. Loosen four bolts (D), and jam-nut (E).
4. Loosen nut (F) to loosen belts (G), and remove bolts from pulley (H).



LH DRIVE - RH OPPOSITE

5. Support deflector assembly (J), and remove bolts (D).
6. Remove deflector assembly (J) from cutterbar area.
7. Position new deflector assembly into cutterbar area, and support deflector against frame.
8. Install four bolts (D), but do not tighten.
9. Install belts (G) onto pulley (H).
10. Tighten nut (F) to tension belts so that each belt deflects 0.12 in (3 mm) when a force of 51 lbf (22 N) is applied at “mid-span”.
11. Tighten four bolts (D) and jam-nut (E).
12. Close driveshield and cutterbar doors.

c. Replacing Driveline Deflector



19 FT - BOTH SIDES

Refer to the Technical Services Manual or your MacDon Dealer.

7.9 DRIVES

7.9.1 Conditioner Drive Belt

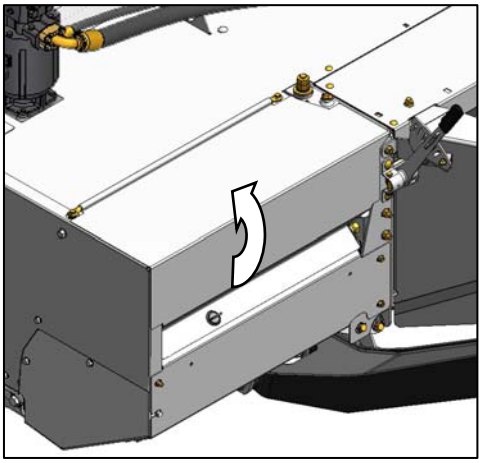
The conditioner drive belt is located inside the drive compartment at the left end of the header, and is tensioned with a spring tensioner. The tension is factory-set so should not require adjusting.

Check the belt tension and inspect for damage or wear every 100 hours or annually, preferably before the start of the cutting season.

DANGER

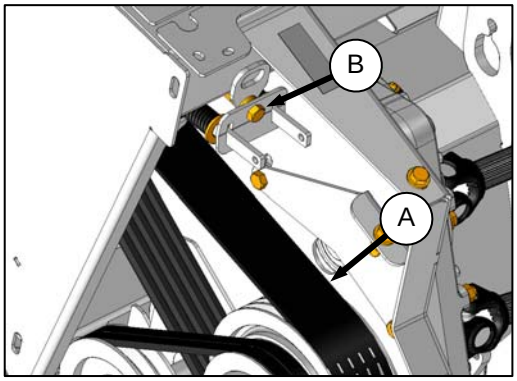
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Lower header to ground, turn off engine, and remove key.



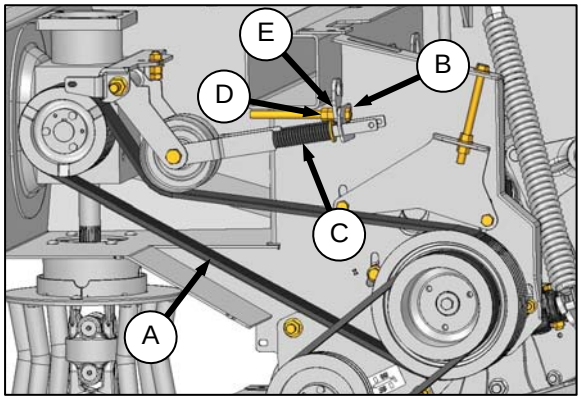
16 FT SHOWN - 19 FT OPPOSITE

b. Open driveshield. See Section 7.5 DRIVESHIELDS.



16 FT SHOWN - 19 FT OPPOSITE

c. Check condition of belt (A).

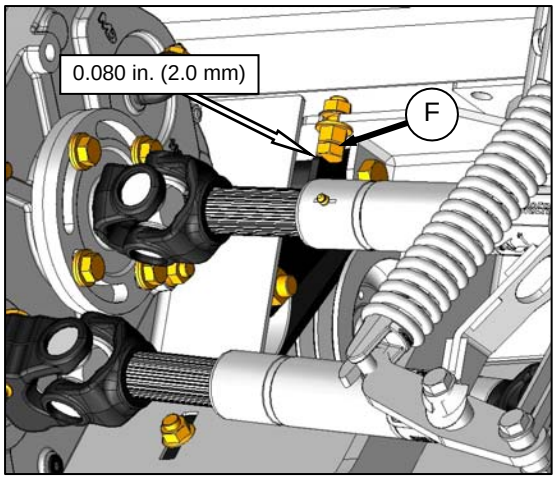


16 FT SHOWN - 19 FT OPPOSITE

d. Check that adjuster bolt (B) is tight, and that it is “fully turned in”. Springs (C) will generally be set to maximum tension, and adjustment will not be required.

However, if adjustment is necessary, adjust tension as follows:

1. Loosen jam-nut (D).
2. Hold nut (E), and turn adjuster bolt (B) clockwise until it bottoms out.
3. Tighten jam-nut (D).



16 FT SHOWN - 19 FT OPPOSITE

4. Check gap at idler arm stop. If necessary, adjust bolt (F) to achieve a 0.08 in. (2.0 mm) gap between bolt and idler arm.

NOTE

Idler arm stop (F) maintains belt tension when header drive is reversed. Maintain required gap.

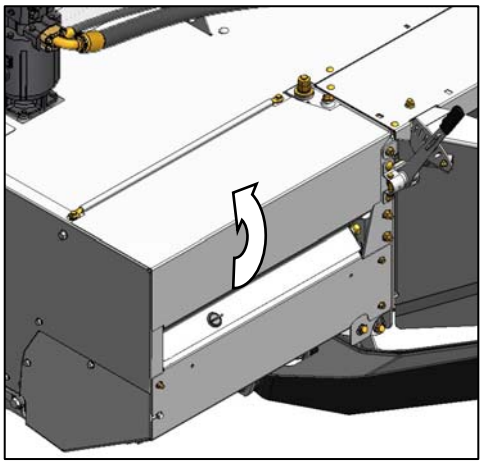
e. Close driveshield.

7.9.1.1 Replacing Conditioner Drive Belt

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

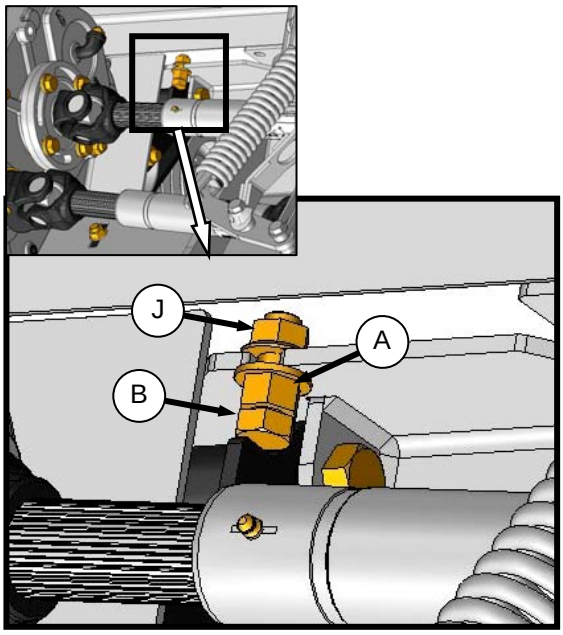
a. Lower header to ground, turn off engine, and remove key.



16 FT SHOWN - 19 FT OPPOSITE

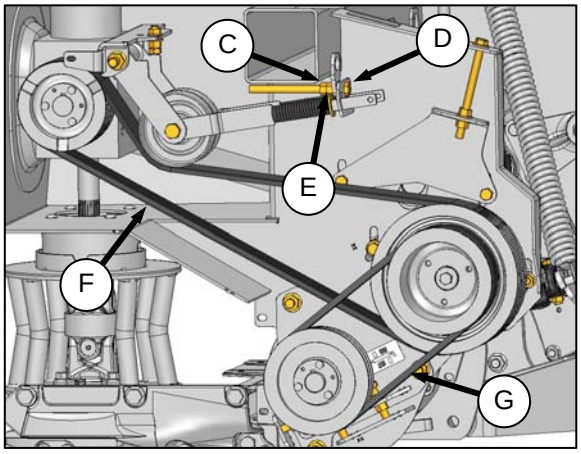
b. Open driveshield. See 7.5 DRIVESHIELDS.

c. Release tension on conditioner drive belt as follows:



16 FT SHOWN - 19 FT OPPOSITE

5. Loosen nut (A) on idler arm stop bolt (B), and remove stop.



16 FT SHOWN - 19 FT OPPOSITE

6. Loosen jam-nut (C) on adjuster bolt (D).
7. Hold nut (E), and turn adjuster bolt (D) to release tension on conditioner drive belt (F).

d. Remove auger drive belts (G). See 7.9.2.1 Replacing Auger Drive Belts, steps c. to f.

e. Remove conditioner drive belt (F).

f. Install new conditioner drive belt (F) onto pulleys, ensuring it is in the pulley grooves.

g. Install and tension auger drive belts (G). See 7.9.2.1 Replacing Auger Drive Belts, steps g to i.

h. Tension conditioner drive belt (F) as follows:
   1. Hold nut (E), and turn adjuster bolt (D) clockwise until it bottoms out.
   2. Tighten jam-nut (C).
   3. Re-install idler arm stop, and adjust lock nut (J) to achieve a 0.08 in. (2.0 mm) gap between the idler arm and the bolt head.
   4. Tighten nut (A).

i. Close driveshield.

7.9.2 Auger Drive Belts

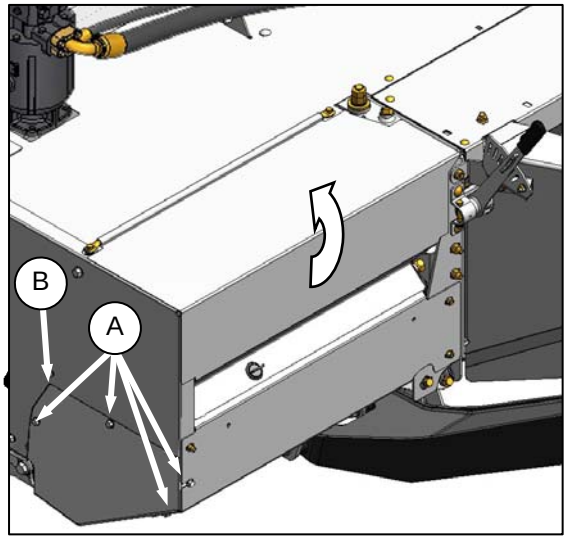
The auger drive belts are located inside the drive compartment at the lower left end.

Check the belt tension and inspect for damage or wear every 100 hours or annually, preferably before the start of the cutting season.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

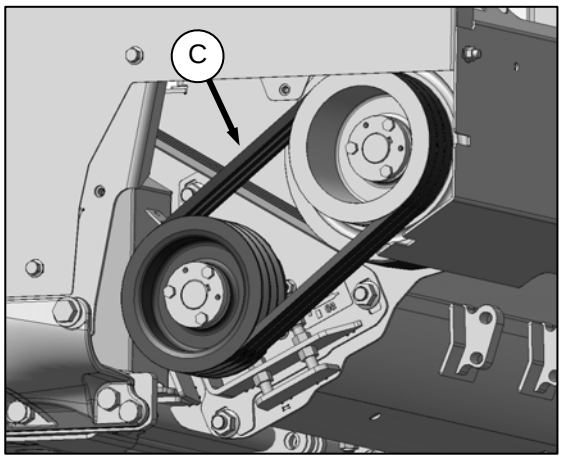
a. Lower header to ground, turn off engine, and remove key.



16 FT SHOWN - 19 FT OPPOSITE

b. Open driveshield. See Section 7.5 DRIVESHIELDS.

c. Remove four bolts (A) and remove cover (B).

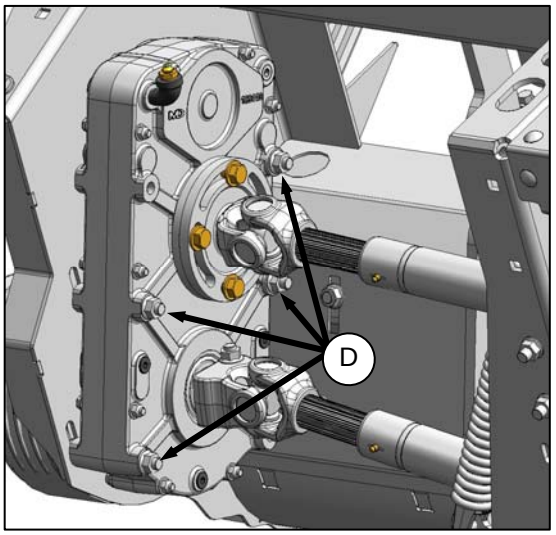


16 FT SHOWN - 19 FT OPPOSITE

d. Check condition of auger drive belts (C). If severely worn or damaged, replace them. Refer to next section.

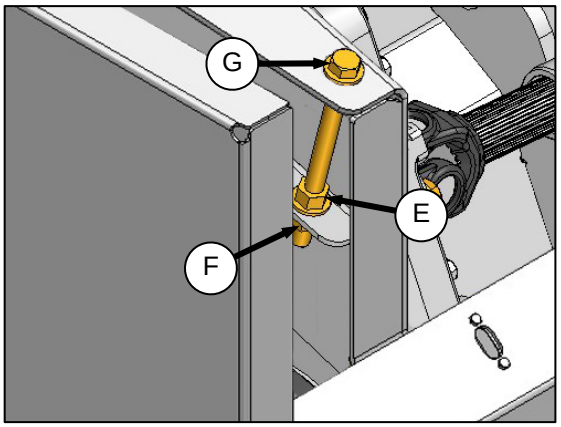
e. Tension on each belt should be such that an 8 - 12 lbf (35 - 40 N) force at “mid-span” deflects the belt 0.16 in. (4 mm).

f. If necessary, adjust belt tension as follows:



16 FT SHOWN - 19 FT OPPOSITE

1. Loosen four bolts (D) securing gearbox to frame.



16 FT SHOWN - 19 FT OPPOSITE

2. Loosen jam-nut (E).
3. Hold nut (F), and turn adjuster bolt (G) to adjust tension.

IMPORTANT

To prolong belt and drive life, do not over-tension belts.

4. Manually turn drive system and re-check tension. Adjust as required.
5. Tighten bolts (D) and jam-nut (E).

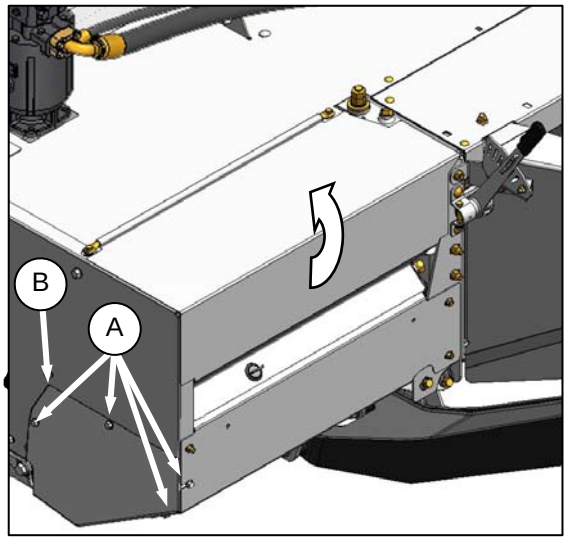
g. Close driveshield.

7.9.2.1 Replacing Auger Drive Belts

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

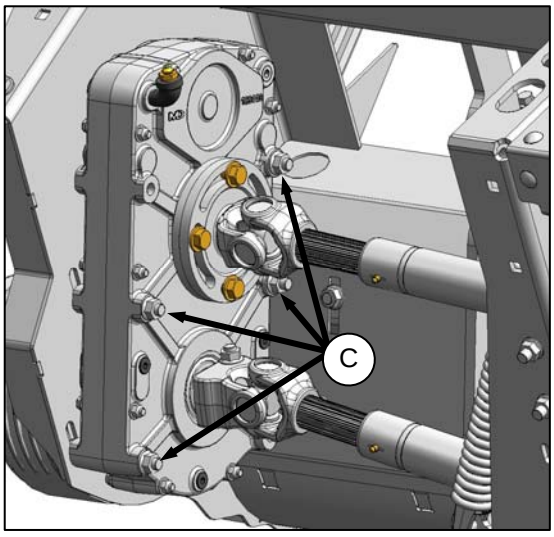
a. Lower header to ground, turn off engine, and remove key.



16 FT SHOWN - 19 FT OPPOSITE

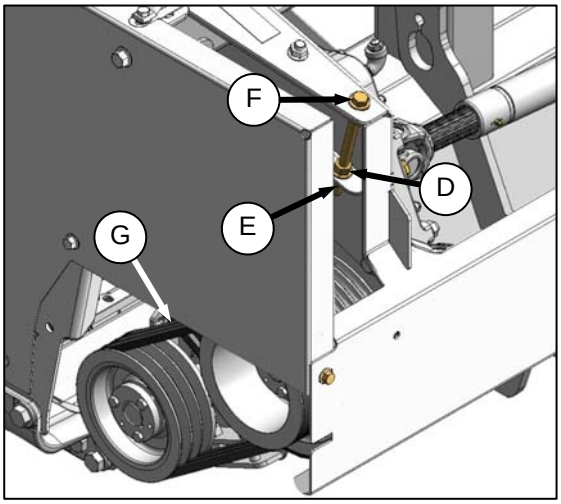
b. Open driveshield. See Section 7.5 DRIVESHIELDS.

c. Remove four bolts (A), and remove cover (B).



16 FT SHOWN - 19 FT OPPOSITE

d. Loosen four bolts (C) securing gearbox to frame. Access nut on lower bolt from opening underneath drive compartment.



16 FT SHOWN - 19 FT OPPOSITE

e. Loosen jam-nut (D).

f. Hold nut (E), and turn adjuster bolt (F) counter-clockwise to release tension on auger drive belts (G).

g. Remove the belts.

NOTE

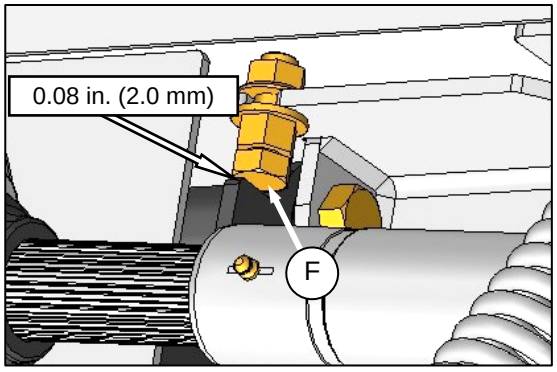
All three belts must be replaced.

NOTE

Check alignment of pulleys. Refer to the Technical Service Manual or your MacDon Dealer if pulleys need re-aligning.

h. Install belts (G) on pulleys ensuring they are in the pulley grooves.

i. Tension the belts. See previous section.



16 FT SHOWN - 19 FT OPPOSITE

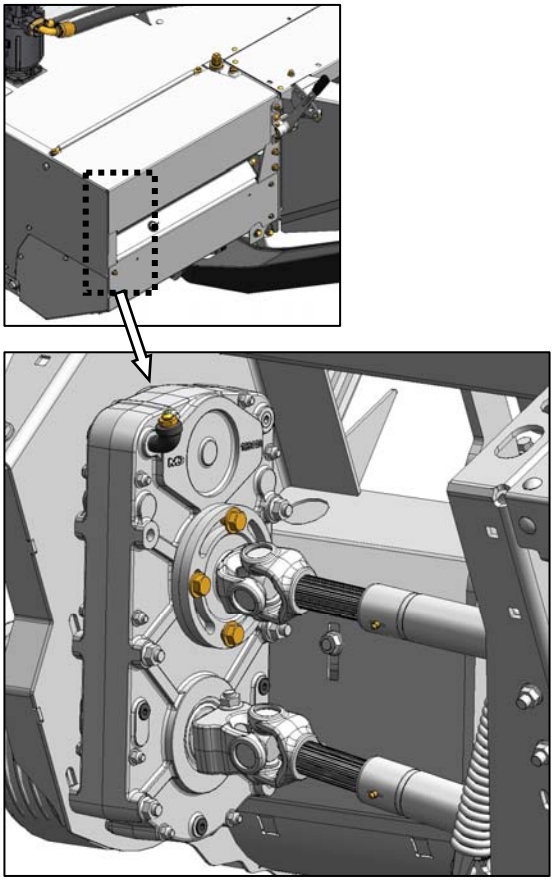
j. Check and if necessary adjust idler arm stop (F) to 0.08 in. (2.0 mm) gap between the idler arm and the bolt head.

k. Re-install cover (B) with bolts (A).

l. Close driveshield.

m. Re-adjust tension of new belts after a short run-in period, (about 5 hours).

7.9.3 Conditioner Gearbox



16 FT SHOWN - 19 FT OPPOSITE

The conditioner gearbox, which transfers power from the bevel gearbox to the conditioner rolls and to the overshot auger, is located inside the drive compartment at the left end of the header.

If repairs are required, it should be removed and serviced at your MacDon Dealer. See your MacDon Dealer or Technical Service Manual.

The only regular servicing required is maintaining the lubricant level, and changing the lubricant according the intervals specified in this manual. See Section 7.12 MAINTENANCE SCHEDULE.

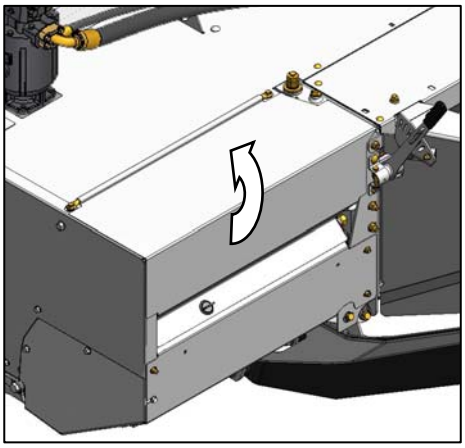
7.9.3.1 Changing Lubricant

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

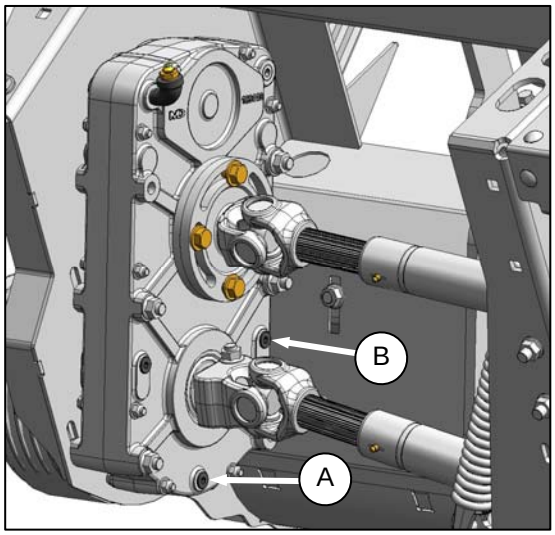
a. Drain the gearbox when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.

b. Raise header to full height, and engage header lift cylinder locks. Stop engine, and remove key.



16 FT SHOWN - 19 FT OPPOSITE

c. Open driveshield. See Section 7.5 DRIVESHIELDS.



16 FT SHOWN - 19 FT OPPOSITE

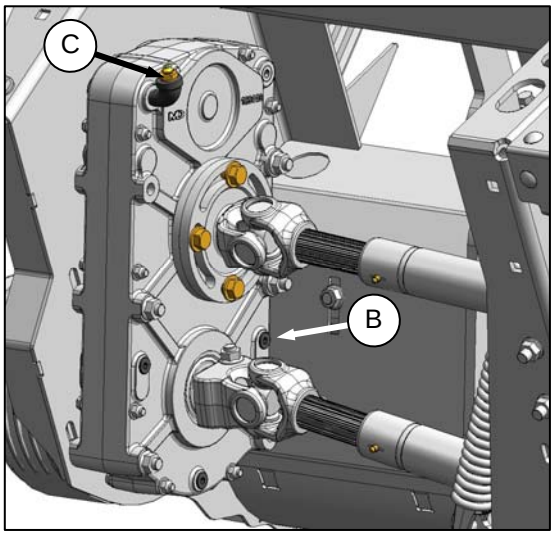
d. Place a suitable container under drain plug (A).

e. Remove plugs (A) and (B).

f. Allow sufficient time for lubricant to drain.

g. Replace plug (A), and tighten.

(continued next page)



16 FT SHOWN - 19 FT OPPOSITE

h. Remove breather and bushing (C) at filler pipe.

i. Add 17 oz. (500 ml) of Traxon E Synthetic 75W90 gear lubricant to gearbox through filler pipe. Lubricant should slightly run out of port (B) when at the proper level.

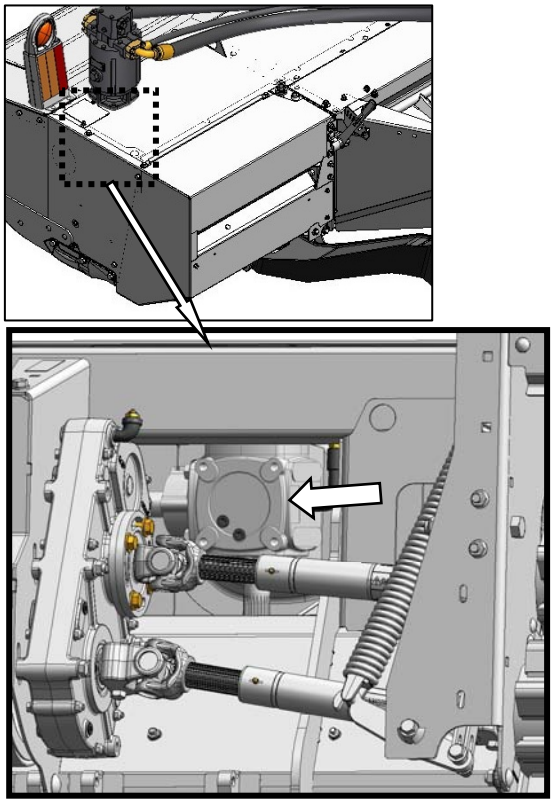
j. Re-install plug (B), and tighten.

k. Re-install bushing and breather (C) in filler pipe, and tighten.

l. Properly dispose of used lubricant, and clean up any spilled lubricant.

m. Close driveshield.

7.9.4 Bevel Gearbox - 16 FT



The bevel gearbox, which transfers power from the hydraulic motor to the header drives, is located inside the drive compartment at the left end of the header.

If repairs are required, it should be removed and serviced at your Dealer. See your MacDon Dealer or Technical Service Manual.

The only regular servicing required is maintaining the lubricant level, and changing the lubricant according the intervals specified in this manual. See Section 7.12 MAINTENANCE SCHEDULE.

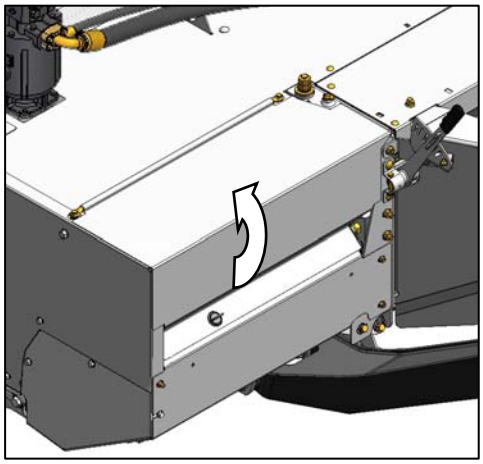
7.9.4.1 Changing Lubricant

DANGER

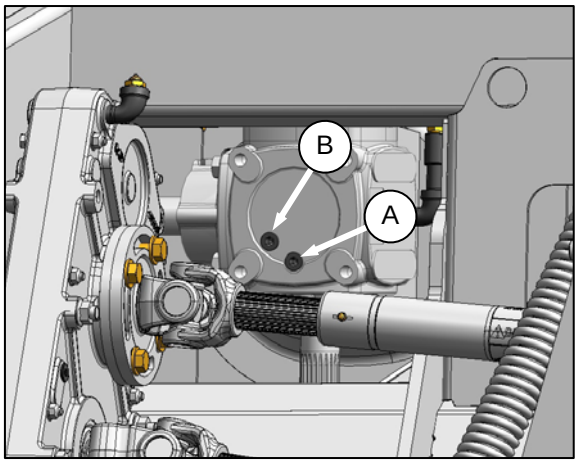
Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Drain the gearbox when the lubricant is warm. If the lubricant is cold, idle the machine for about 10 minutes prior to draining.

b. Raise header to full height and engage header lift cylinder locks. Stop engine, and remove key.



c. Open driveshield. See Section 7.5 DRIVESHIELDS.



d. Place a suitable container under drain plug (A).

e. Remove plugs (A) and (B).

f. Allow sufficient time for lubricant to drain.

g. Disengage header lift cylinder locks, start engine, and lower header so that it is level.

h. Replace plug (A).

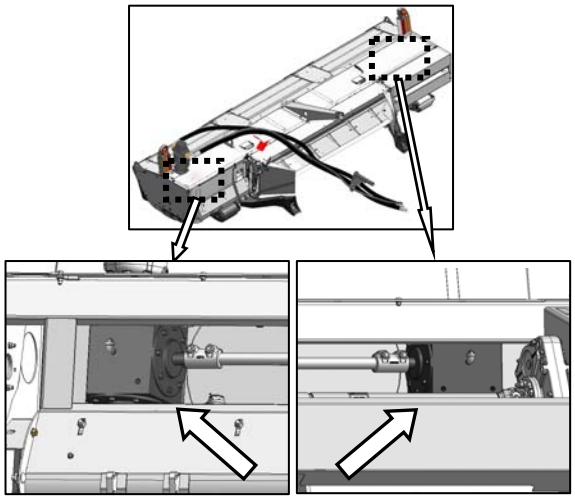
i. Add 13.5 oz. (400 ml) of Traxon E Synthetic 75W90 gear lubricant to gearbox through port (B). Lubricant should slightly run out of port (B) when at the proper level.

j. Replace plug (B), and tighten.

k. Properly dispose of used lubricant, and clean up any spilled lubricant.

l. Lower driveshield.

7.9.5 Bevel Gearboxes - 19 FT



The 19 FT header uses two bevel gearboxes.

One gearbox is attached to the hydraulic drive motor, and transfers power to one of the two cutterbars, and to the second gearbox at the opposite end of the header via a cross-shaft.

The second gearbox, which is located inside the right hand drive compartment, powers the hay conditioner, the overshot auger, and the second cutterbar.

If repairs to the gearboxes are required, they should be removed and serviced at your Dealer. See your MacDon Dealer or Technical Service Manual.

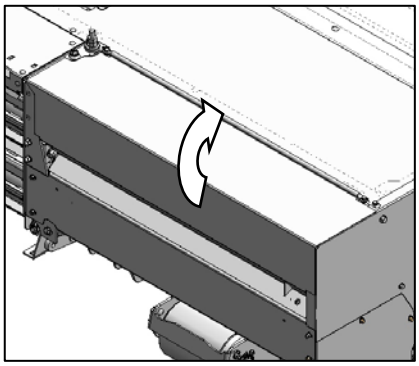
The only regular servicing required is maintaining the lubricant level, and changing the lubricant according the intervals specified in this manual. See Section 7.12 MAINTENANCE SCHEDULE.

7.9.5.1 Adding Lubricant

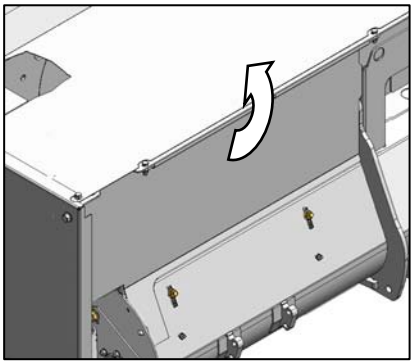
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. The header should be level.

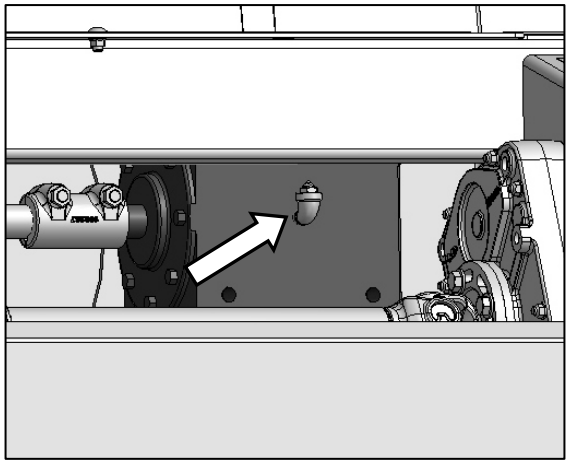


RIGHT SHIELD



LEFT SHIELD

b. Open driveshields. See Section 7.5 DRIVESHIELDS.



RH SHOWN - LH OPPOSITE

c. Remove elbow/breather assembly. If oil runs out, there is sufficient lubricant in the gearbox.
d. If required, add Traxon E Synthetic 75W90 gear lubricant to gearbox through port. Lubricant should slightly run out of port when at the proper level.
e. Replace elbow/breather assembly, and tighten.
f. Close driveshields.

7.9.6 Header Drive Speed Sensor

The header drive speed sensor monitors the rotational speed of the auger pulley, and sends a signal to the systems monitor in the Operator's station to display disc speed.

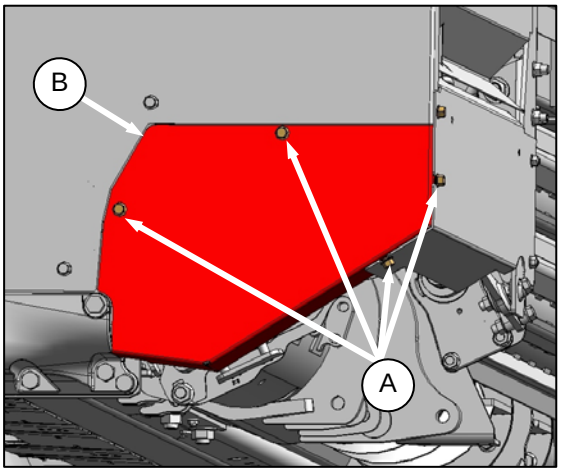
It does not require regular maintenance. If it malfunctions or is damaged, it can be easily adjusted or replaced.

DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

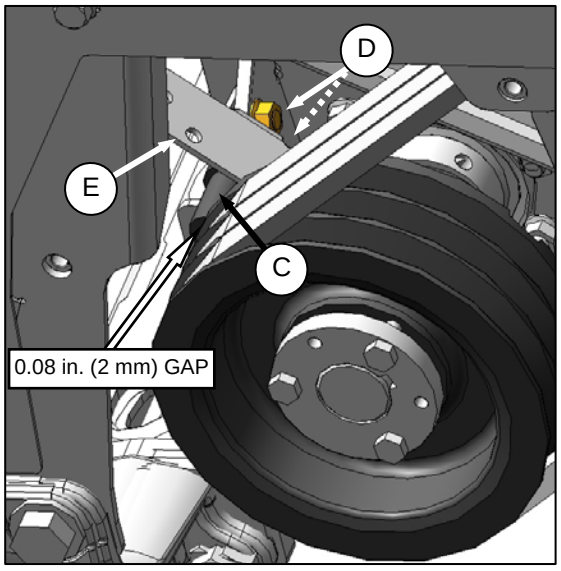
7.9.6.1 Adjustment

a. Lower header to ground, turn off engine, and remove key.



16 FT SHOWN - 19 FT OPPOSITE

b. Remove bolts (A), and remove cover (B).



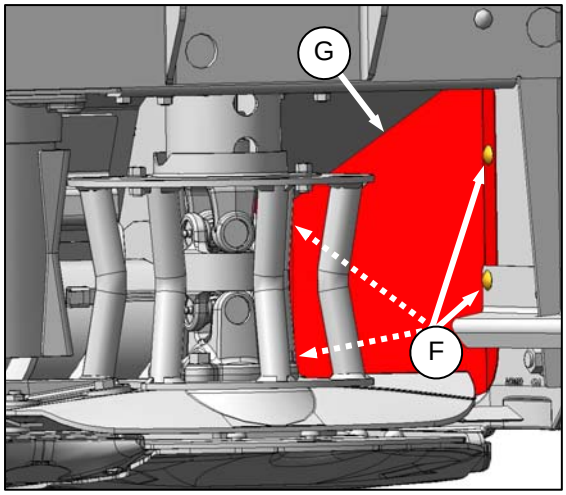
16 FT SHOWN - 19 FT OPPOSITE

c. Check that gap between pulley and sensor (C) is 0.08 in. (2 mm). If necessary adjust as follows:
   1. Loosen bolts (D), and move mounting bracket (E) to adjust gap to required dimension.
   2. Tighten bolts (D).

7.9.6.2 Replacement

a. Remove bolts (A) and remove shield (B).

b. Open cutterbar door at **right** end of 19 FT header **(left** end of 16 FT header).



16 FT SHOWN - 19 FT OPPOSITE

c. Remove four bolts (F), and remove shield (G) at end of cutterbar.

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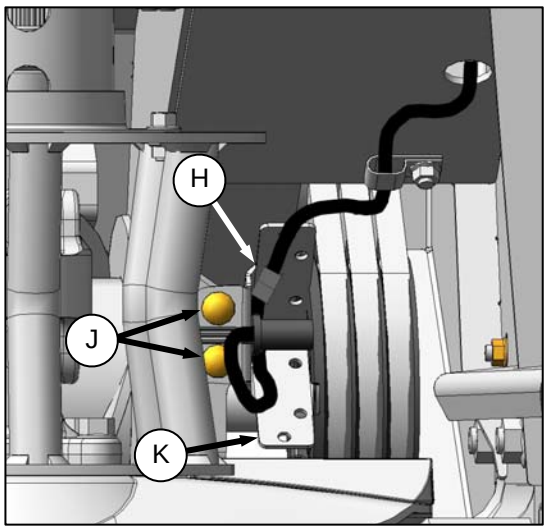
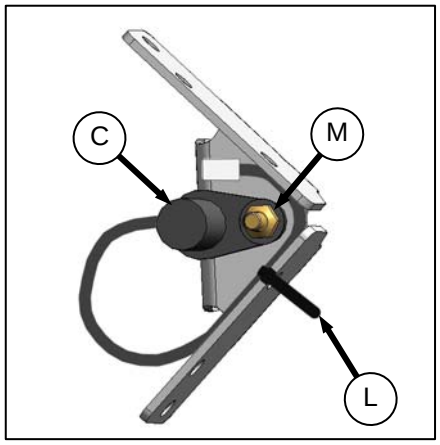


16 FT SHOWN - 19 FT OPPOSITE

d. Unplug sensor wire connector (H).

e. Remove two bolts (J) securing sensor bracket (K) to frame, and remove bracket with sensor.



f. Cut plastic tie (L) securing sensor wire to bracket.

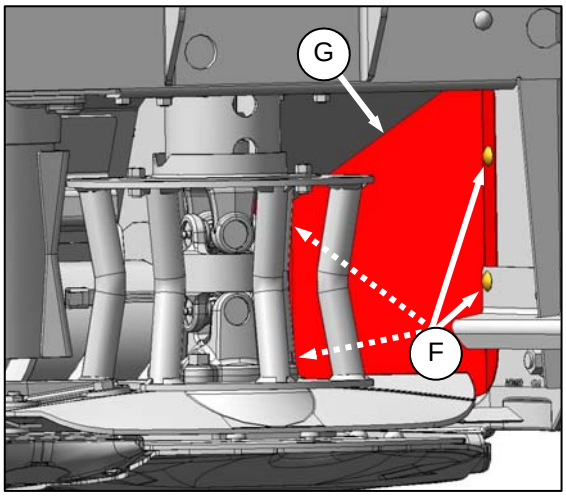
g. Remove nut and bolt (M) securing sensor (C) to bracket, and remove sensor.

h. Install new sensor (C) onto bracket with bolt (M) and nut.

i. Secure sensor wire to bracket with plastic tie (L).

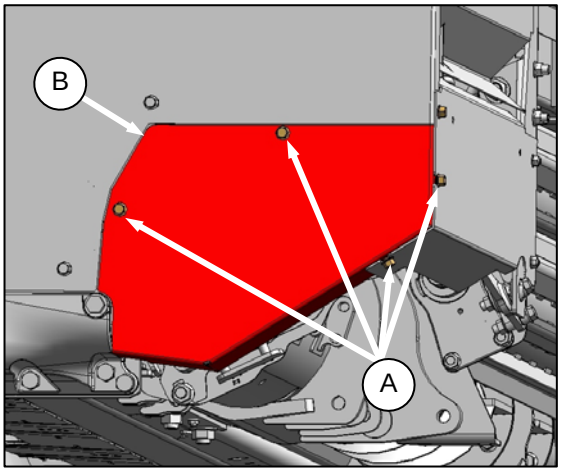
j. Install bracket onto frame with bolts (J). Check that gap between sensor and pulley is 0.08 in. (2 mm).

k. Connect sensor to wiring harness connector (H).



16 FT SHOWN - 19 FT OPPOSITE

l. Replace shield (G), and secure with bolts (F).



16 FT SHOWN - 19 FT OPPOSITE

m. Replace shield (B), and secure with bolts (A).

7.10 HYDRAULICS

Refer to your MacDon Self-Propelled Windrower Operator's Manual for hydraulic system maintenance procedures for self-propelled windrowers.

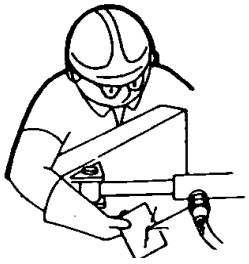
7.10.1 Hoses and Lines

Check hydraulic hoses and lines daily for signs of leaks.

WARNING

- **Avoid high-pressure fluids. Escaping fluid can penetrate the skin causing serious injury.**
- **Relieve pressure before disconnecting hydraulic lines.**

Tighten all connections before applying pressure. Keep hands and body away from pin- holes and nozzles which eject fluids under high pressure.
- **If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor who is familiar with this type of injury or gangrene may result.**



- **Use a piece of cardboard or paper to search for leaks.**

IMPORTANT

Keep hydraulic coupler tips and connectors clean. Dust, dirt, water and foreign material are the major causes of hydraulic system damage.

DO NOT attempt to service hydraulic system in the field. Precision fits require WHITE ROOM CARE during overhaul.

7.10.2 Hydraulic Motor

The hydraulic drive motor does not require any maintenance.

If repairs are required, it should be removed and serviced at your MacDon Dealer. Refer to the Technical Service Manual for removal and installation procedures.

7.11 ELECTRICAL

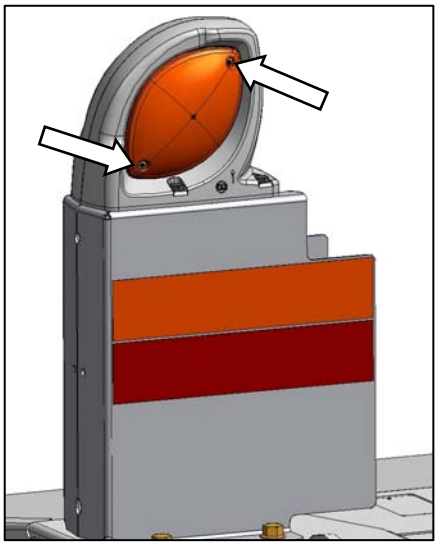
DANGER

Stop engine, and remove key from ignition before leaving Operator's seat for any reason. A child or even a pet could engage an idling machine.

a. Use electrical tape and wire clips as required to prevent wires from dragging or rubbing.

b. Keep lights clean, and replace defective bulbs.

7.11.1 Light Bulb and Lens Replacement



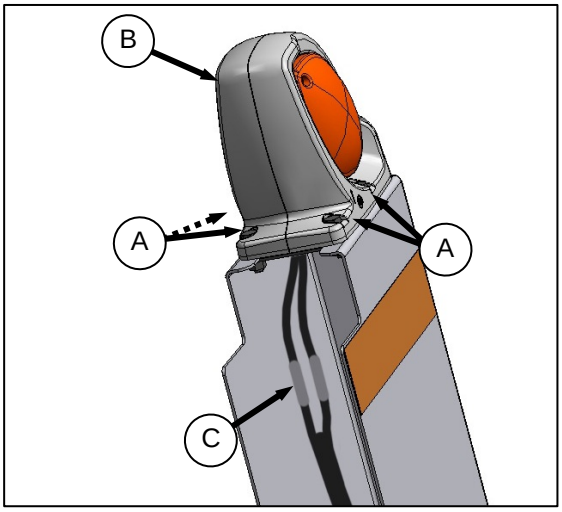
a. Using a Phillips screwdriver, remove screws from fixture, and remove plastic lens.

b. Replace bulb, and re-install plastic lens and screws.

NOTE

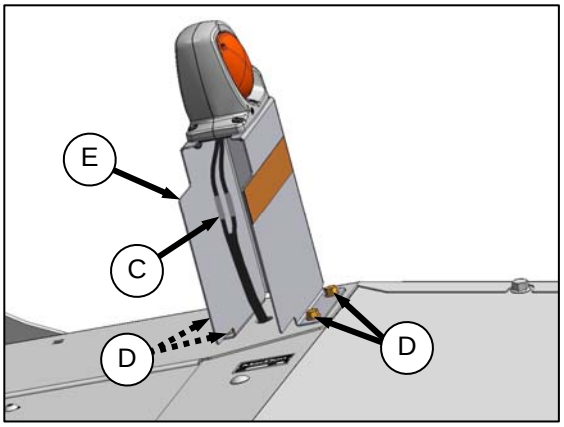
See Parts Catalog for Bulb Part Number.

7.11.2 Light Replacement



a. Remove four bolts (A) and nuts, and remove lamp assembly (B) from lamp bracket.
b. Disconnect lamp wires from wiring harness at connectors (C).
c. Connect new lamp wires to wiring harness (C).
d. Place lamp assembly (B) on lamp bracket and secure with four bolts (A) and nuts

7.11.3 Lamp Assembly Replacement



a. Disconnect lamp wires from wiring harness at connectors (C).
b. Remove four bolts (D) and remove lamp assembly (E) from header.
c. Place new lamp assembly (E) on header and secure with four bolts (D).
d. Connect lamp wires to wiring harness (C).
e. To replace light bulb:
    1. Using a Phillips screwdriver, remove two screws from fixture, and remove plastic lens.
    2. Replace bulb, and re-install plastic lens and with screws.

7.12 MAINTENANCE SCHEDULE

The following maintenance schedule lists the periodic maintenance procedures, organized by service intervals. Regular maintenance is the best insurance against early wear and untimely breakdowns. Following this schedule will increase machine life.

For detailed instructions, refer to the specific headings in Section 7 MAINTENANCE AND SERVICING. Use the fluids and lubricants specified in Section 7.3.2 Recommended Lubricants.

Service Intervals: The recommended service intervals are in hours of operation.

Where a service interval is given in more than one time frame, e.g. "100 hours or Annually", service the machine at whichever interval is reached first.

IMPORTANT

Recommended intervals are for average conditions. Service the machine more often if operated under adverse conditions (severe dust, extra heavy loads, etc.).

CAUTION

Carefully follow safety messages given in Section 7.2 RECOMMENDED SAFETY PROCEDURES**.**

7.12.1 Break-In Inspections

HOURS	ITEM	INSPECTION	SECTION
5	Hardware	Check For Loose Hardware. Tighten To Required Torque.	7.3.1
	Drive Belts	Check Tension.	7.9.1 & 7.9.2
25	Drive Belts		
50	Drive Belts		
	Cutterbar Lubricant	Change. **Use Only Specified Amount. Do Not Overfill.**	7.8.1
	Conditioner Gear Box Lubricant	Change.	7.9.3.1
	Bevel Gearbox Lubricant	Change.	7.9.4.1 & 7.9.5.1
150	Bevel Gearbox Lubricant	Change.	
	Conditioner Gear Box Lubricant	Change.	7.9.3.1
	Cutterbar Lubricant	Change. **Use Only Specified Amount. Do Not Overfill.**	7.8.1

7.12.2 Interval Maintenance

INTERVAL	SERVICE	SECTION
FIRST USE	Break-In Inspections (see Section 7.12.1 on previous page).	7.12.1
100 HOURS OR ANNUALLY *	1. Check Bevel Gearbox Lubricant Level. 2. Check Conditioner Drive Belt Tension. 3. Check Auger Drive Belts Tension. 4. Check Conditioner Drive Gearbox Lubricant Level.	7.9.4 & 7.9.5 7.9.1 7.9.2 7.9.3
END OF SEASON	See Section 6.13 STORAGE.	6.13
10 HOURS OR DAILY	1. Check Hydraulic Hoses And Lines For Leaks. 2. Check Cutter Blades For Security And Condition. 3. Check Cage Deflectors For Security And Condition.	--- 7.8.4.1 7.8.6
25 HOURS	1. Grease Cutterbar Driveline Bearings. 2. Grease Roll Universal Shafts.	7.7.2
50 HOURS	1. Grease Roll Shaft Bearings. 2. Grease Drive Belt Tensioner. 3. Grease Gauge Roller Bearings (if installed).	
250 HOURS	1. Change Bevel Gearbox Lubricant. 2. Change Cutterbar Lubricant. **Use only specified amount. Do not overfill.** 3. Change Conditioner Drive Gearbox Lubricant.	7.9.4.1 & 7.9.5.1 7.8.1 7.9.3

*** IT IS RECOMMENDED THAT ANNUAL MAINTENANCE BE DONE PRIOR TO START OF OPERATING SEASON.**

7.12.3 Maintenance Record

	ACTION:	✓ - Check	♦ - Lubricate	▲ - Change																			
MAINTENANCE RECORD	Hour Meter Reading																						
	Date																						
	Serviced By																						
FIRST USE		Refer To Section 7.12.1 Break-in Inspections																					
100 HOURS OR ANNUALLY																							
✓	Conditioner Drive Belt																						
✓	Auger Drive Belts																						
✓	Conditioner Gearbox Lubricant Level																						
✓	Bevel Gearbox Lubricant Level																						
END OF SEASON		Refer To Section 6.13 STORAGE																					
10 HOURS OR DAILY		**NOTE: A RECORD OF DAILY MAINTENANCE IS NOT NORMALLY REQUIRED, BUT IS AT THE OWNER/OPERATOR'S DISCRETION.**																					
✓	Hydraulic Hoses and Lines																						
✓	Cutter Blades, Deflectors and Discs																						
25 HOURS																							
♦	Roll Universal Shafts																						
♦	Cutterbar Driveline Bearings																						
50 HOURS																							
▲	Cutterbar Lube - First 50 & 150 HRS																						
▲	Bevel Gearbox Lube - First 50 & 150 HRS																						
▲	Cond. Gearbox Oil - First 50 & 150 HRS																						
♦	Drive Belt Tensioner																						
♦	Roll Shaft Bearings																						
♦	Gauge Roller Bearings																						
250 HOURS																							
▲	Cutterbar Lube																						
▲	Conditioner Drive Gearbox Lube																						
▲	Bevel Gearbox Lube																						

8 TROUBLESHOOTING

8.1 MOWER PERFORMANCE

SYMPTOM	PROBLEM	SOLUTION	SECTION
Cutterbar Plugging.	Dull, bent, or badly worn blades.	Replace blades.	7.8.4.2
	Auger drive belt slipping.	Adjust tension. Change belts.	7.9.2
	Conditioner drive belt slipping.		7.9.1
	Build-up of dirt between rock guards.	Decrease header angle, and increase float. In some conditions, it may be necessary to carry header slightly with header lift cylinders.	6.10.6 & 6.10.1
Strips Of Uncut Crop Left On Field.		Decrease header angle and increase float.	
	Bent cutter blades.	Replace blades.	7.8.4.2
	Excessive header speed.	Reduce header disc speed.	6.10.8
	Foreign object on cutterbar.	Disengage header, and stop engine. When all moving parts are completely stopped, remove foreign object.	6.12
	Ground speed too slow.	Increase ground speed.	6.10.9
Conditioner Rolls Plugging.	Ground speed too fast.	Reduce ground speed.	
	Roll gap too large for proper feeding.	Decrease roll gap.	6.10.2
	Roll gap too small in thick stemmed cane-type crops.	Increase roll gap.	
	Baffle set too low.	Raise baffle.	6.10.5.3
	Roll speed too low.	Increase disc speed.	6.10.8
	Foreign object between rolls.	Disengage header, and stop engine. When all moving parts are completely stopped, remove foreign object.	---
	Conditioner belt slipping.	Adjust belt tension.	7.9.1
	Auger belt slipping.		7.9.2
	Cutting height too low.	Decrease header angle to raise cutting height.	6.10.6
	Rolls improperly timed.	Adjust roll timing.	6.10.4
Cutting Height Varies From One Side To The Other.	Float not properly balanced.	Adjust header float.	6.10.1

TROUBLESHOOTING

SYMPTOM	PROBLEM	SOLUTION	SECTION
Ragged Or Uneven Cutting Of Crop.	Header float too light, causing bouncing.	Adjust to heavier float setting.	6.10.1
	Excessive ground speed.	Reduce ground speed.	6.10.9
	Header angle too flat for guards to pick up down crop.	Increase header angle.	6.10.6
	Downed crop.	Adjust header angle to cut closer to ground.	
Uneven Formation And Bunching Of Windrow.	Rear deflector bypassing or dragging crop.	Adjust rear deflector for proper crop control.	6.10.5.2
	Forming shields improperly adjusted.	Adjust forming shields.	6.10.5
	Roll gap too large.	Adjust roll gap.	6.10.2
	Auger belts slipping.	Replace belts.	7.9.2
	Conditioner rolls running too slow.	Maintain rated header speed.	See Windrower Operator's Manual.
Uneven Windrow Formation In Light Crop.	Uneven feeding.	Reduce header speed.	
Plugging Behind End Cage Deflectors.	Not cutting full header width.	Cut full header width.	---
	Ground speed too slow.	Increase ground speed.	6.10.9
Not Cutting Short Enough In Down Crop.	Ground speed too fast.	Reduce ground speed.	
	Broken, bent or dull blades.	Replace blades or turn blades over.	7.8.4.2
	Cutting height too high.	Adjust header angle to lower cutting height if field conditions allow.	6.10.6
Material Being Pulled Out By Roots When Cutting Tall Crop Leaning Into Machine.	Crop in conditioner rolls before crop is cut.	Increase roll gap.	6.10.2
Damaged Leaves And Broken Stems.	Insufficient roll gap.		
	Roll timing off.	Check roll timing, and adjust if necessary.	6.10.4
Slow Crop Drying.	Crop is bunched in windrow.	Adjust forming shields/baffle.	6.10.5
	Rolls not crimping crop sufficiently.	Decrease roll gap.	6.10.2
Excessive Drying Or Bleaching Of Crop.	Excessive crimping.	Increase roll gap.	
	Crop is spread too wide in windrow.	Adjust forming shields.	6.10.5
Poorly Formed Or Bunchy Windrows.	Forming shields not properly adjusted.		

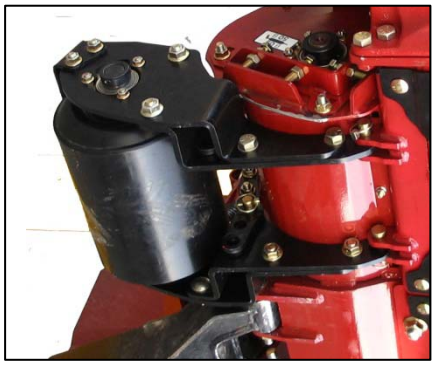
8.2 MECHANICAL

SYMPTOM	PROBLEM	SOLUTION	SECTION
Excessive Noises.	Bent cutter blade.	Replace blade.	7.8.4.2
	Conditioner roll timing off.	Check roll timing, and adjust if necessary.	6.10.4
	Conditioner roll gap too small.	Check gap, and adjust if necessary.	6.10.2
Excessive Vibration Or Noise In Header.	Conditioner rolls contacting each other.	Increase roll gap.	
		Check roll timing.	6.10.4
	Auger center support loose.	Tighten bolts on support.	6.10.10
	Mud deposits on conditioner rolls.	Clean rolls.	---
Excessive Heat In Cutterbar.	Too much lubricant in cutterbar.	Drain lubricant, and refill with specified amount.	7.8.1
Frequent Blade Damage.	Mud on cutterbar.	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	---
	Spindle bearing failure.	Replace spindle bearing.	See MacDon Dealer.
	Material wrapped around spindle.	Remove disc, and remove material.	7.8.3
	Cutting too low in rocky field conditions.	Decrease header angle. Increase float.	6.10.6 & 6.10.1
	Ground speed too high in rocky field conditions. Note: high ground speed tends to dig rocks from ground, instead of floating over them.	Reduce ground speed.	6.10.9
	Blade incorrectly mounted.	Check all blade mounting hardware ensuring blades are free to move.	7.8.4.1
	Header float set too heavy.	Increase float.	6.10.1
Machine Pulling To One Side.	Header dragging on one end and pulling to that side.	Adjust header float on both ends.	
Excessive Wear Of Cutting Components.	Header angle too steep.	Reduce header angle.	6.10.6
	Crop residue and dirt deposits on cutterbar.	Clean cutterbar.	---
	Mud on cutterbar.	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	

SYMPTOM	PROBLEM	SOLUTION	SECTION
Breakage Of Conditioner Drive Belt.	Improper belt tension.	Adjust conditioner drive belt tension.	7.9.1
	Belt not in proper groove in pulley.	Move belt to proper groove.	
	Foreign object between rolls.	Disengage header and stop engine. When all moving parts are completely stopped, remove foreign object.	---
	Belt pulleys and idlers misaligned.	Align pulleys and idler.	See MacDon Dealer.
Discs Don't Turn When Engaging Header.	Mud on cutterbar.	Remove mud from cutterbar. Do not allow mud to dry on cutterbar.	---
	Faulty drive belt.	Check belt on pulleys.	7.9.1
	Hoses not connected.	Connect hoses.	6.5
Header Slows When Going Uphill.	Hydraulic oil level in windrower is low.	Add oil to windrower reservoir.	See Windrower Operator's Manual.
Header Runs While Unloaded But Slows Or Stops When Starting To Cut.	Defective hydraulic motor.	Repair/replace hydraulic motor.	See MacDon Dealer.
	Defective hydraulic pump in windrower.	Repair/replace pump.	
	Defective relief valve in windrower.	Repair/replace relief valve.	
	Cold oil in hydraulic drive system.	Reduce ground speed until oil reaches operating temperature.	6.10.9

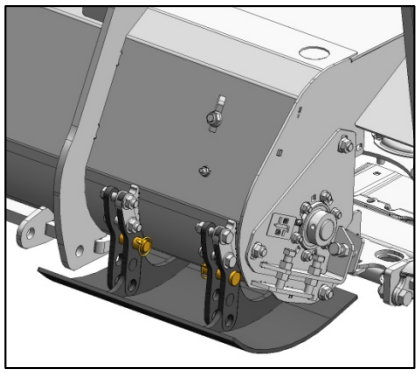
9 OPTIONS AND ATTACHMENTS

9.1 GAUGE ROLLER KIT



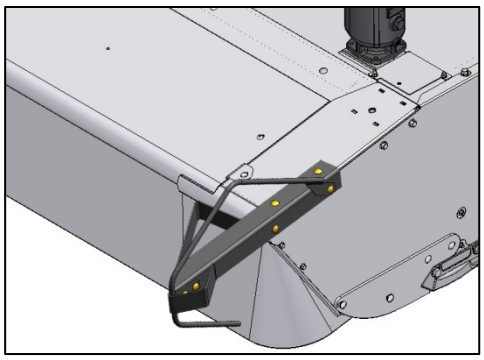
The gauge roller kit installs at either end of the cutterbar, and the rollers can be adjusted for varying cutting height. The kit includes two roller assemblies, attachment hardware, and installation instructions.

9.2 SKID SHOE KIT



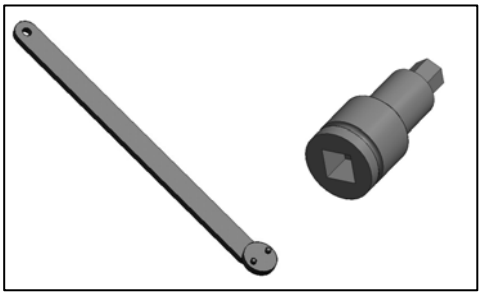
The skid shoe kit installs at either end of the cutterbar. The shoes can be adjusted for varying cutting height. The kit includes two skid shoe assemblies, attachment hardware, and installation instructions.

9.3 TALL CROP DIVIDER KIT



The tall crop dividers attach to the ends of the header for clean crop dividing and cutterbar entry in tall crops. The kit includes left and right dividers, and attachment hardware.

9.4 CUTTERBAR REPAIR TOOL KIT



The cutterbar repair tool kit contains the necessary tools for replacement of the cutterbar idler gears. Refer to the Technical Service Manual for instructions.

9.5 DOUBLE WINDROW ATTACHMENT

The double windrow attachment (DWA) can be attached to the M Series Windrower to enable double windrowing. The kit includes all the necessary fittings, and installation and operating instructions.

10 UNLOADING AND ASSEMBLY

Refer to R85 Rotary Disc Self-Propelled Windrower Header Unloading and Assembly Instructions (Form 169488), and the yellow Pre-Delivery Checklist that are included with your shipment.

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